

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

Reserve
aHD1868
.E93
1982

Rural Development Services

301 West 53rd Street/23J

• New York, N.Y. 10019

Tel. (212) 974-9406

AN EVALUATION OF THE BOLIVIAN FOOD FOR DEVELOPMENT PROGRAM:

ITS INSTITUTIONAL PERFORMANCE AND IMPACT ON FARMERS

1979 - 1981

By

John K. Hatch
Michael S. Hanrahan
Nancy Hirschhorn
Charles R. Connolly
Gerald A. Faich

March 31, 1982

Prepared under Contract No. 53-3148-2-2002 between Rural Development Services and the U.S. Department of Agriculture, Foreign Agricultural Service, dated January 8, 1982.

United States
Department of
Agriculture





Rural Development Services

301 West 53rd Street/23J • New York, N.Y. 10019

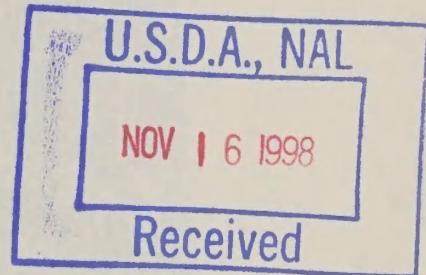
Tel. (212) 974-9406

AN EVALUATION OF THE BOLIVIAN FOOD FOR DEVELOPMENT PROGRAM: ITS INSTITUTIONAL PERFORMANCE AND IMPACT ON FARMERS

1979 - 1981

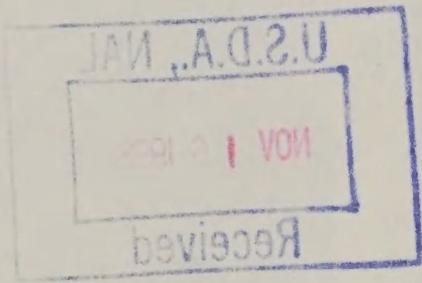
By

John K. Hatch
Michael S. Hanrahan
Nancy Hirschhorn
Charles R. Connolly
Gerald A. Faich



March 31, 1982

Prepared under Contract No. 53-3148-2-2002 between Rural Development Services and the U.S. Department of Agriculture, Foreign Agricultural Service, dated January 8, 1982.



DEDICATION



This report is dedicated, with great respect and admiration, to the tens of thousands of rural households in Bolivia who must wrest their meagre subsistence from Mother Earth under conditions of extreme privation. They gain their livelihood in some of the world's least hospitable environments for farming. They depend on family labor wielding home-made implements and oxen pulling wooden plows, yet while both man and beast are poorly nourished, they must never tire or fall sick. Denied access to production credit, these households must save their own seed even before setting aside for family consumption. Most family members will never receive more than three years of schooling. Fewer still will ever live in a home with electricity and running water. And the average household will see one of its members die needlessly of a preventable disease or accident for want of opportune medical attention. In a lifetime these families will never mail or receive a letter, nor record their births and deaths in any register.

These are the powerless and invisible people America pledged to reach with its Food for Development Program to Bolivia.

A C K N O W L E D G E M E N T S

The members of the evaluation team wish to express their very sincere gratitude to the Executive Secretariat of the Bolivian Food for Development Program, which provided the fullest and most helpful cooperation to the evaluators. Records were fully available, PL480 staff assisted tirelessly in logistical arrangements, discussions were always frank and open, and even the smallest request for assistance or information was immediately satisfied. Different members of the Secretariat's technical staff accompanied the external evaluators in their field trips to make sure all institutional contacts took place and interviews completed with the most appropriate officials with the least complications. Yet PL480 personnel made it their practice to discreetly slip away so the evaluators could talk in confidence with implementing agency personnel about their relations with the Secretariat. Without such excellent and constant support from the Secretariat, this evaluation would have floundered on the rocks of over-zealousness --attempting to cover too much too fast. For their complete cooperation and assistance, all Secretariat staff are warmly thanked.

Thanks are also in order for several members of the U.S. Mission, who went out of their way to provide for the care and feeding of the evaluators, and in whose homes important contacts with GOB officials were arranged in an informal atmosphere conducive to dialogue. We also wish to thank the many officials of project implementing agencies under the PL480 Program who gave generously of their time, facilitated contacts with project users, and on occasion provided vehicles and other logistical support to expedite community visits.

TABLE OF CONTENTS

	Page
DEDICATION	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
I. INTRODUCTION AND SUMMARY	1
A. Overview of the Bolivian Food for Development Program	1
B. Purpose of the Evaluation	2
C. Methodology and Participants	3
D. Summary of Findings: Program Strengths	4
E. Summary of Findings: Program and Project Weaknesses	7
F. Summary of Findings: Recommendations	10
II. PROGRAM ADMINISTRATION	18
A. Financial Overview	18
B. Staffing of the Executive Secretariat	19
C. Accounting Records and Financial Controls	20
D. Project Review Procedures	22
E. Field Supervision of Projects	25
F. Project-Level Perceptions of the Executive Secretariat	27
G. An Appraisal of the Program's Annual Reports	27
III. PERFORMANCE OF SPECIFIC PROJECTS	29
A. Wheat Collection Centers	29
B. Development of Integral Cooperatives	37
C. Colonization Roads	40
D. Agricultural Service Centers	42
E. Pesticide Control and Plant Quarantine	43
F. Forestation Projects	47
G. Small Irrigation Systems	54
H. Small Farmer Credit and Crop Insurance	60
I. Campesino Scholarship Fund	67
J. Rural Development Studies	70

Table of Contents, page 2	Page
IV. THE DEPARTMENTAL DEVELOPMENT CORPORATIONS	73
A. Financial Overview	73
B. General Description of DDC Operations	75
C. Findings at the Individual Project Level	77
D. Findings at the User Level	80
E. Recommendations	80
V. HEALTH SECTOR PROJECTS	
A. Chagas' Disease	83
B. Tuberculosis Detection and Treatment	84
C. Yellow Fever Control	86
D. Malaria Control	89
E. Expanded Immunization Program	93
F. The Nutrition Improvement Project	103
VI. BOLIVIAN GOVERNMENT COMPLIANCE WITH SELF-HELP MEASURES AND POLICY COMMITMENTS	
A. Self-Help Measures	108
B. Policy Commitments	112
ANNEXES	
A. List of Persons Contacted: Institutional Evaluation	
B. List of Persons Contacted: Beneficiary Interviews	
C. Schedule of Evaluation Activities	
D. Campesino Staff Who Conducted the Impact Evaluation	
E. Tables of Health Data: Faich Report	

I. INTRODUCTION AND SUMMARY

A. OVERVIEW OF THE BOLIVIAN FOOD FOR DEVELOPMENT PROGRAM

In May 1978 the Governments of Bolivia and the United States of America negotiated a Food for Development (PL480 Title III) Program Agreement. This was the first Title III program established anywhere in the Third World. The undertaking was budgeted at US\$75 million over a five-year period (1979-1983) and contemplated the execution of eleven agricultural sector projects and two health sector projects. Both project and program management costs were to be financed with local currency generated from the sale of flour milled in Bolivia from U.S. wheat shipments valued at roughly US\$15 million per year. To the extent this currency was actually spent on projects authorized in the Program Agreement, an equivalent amount of the wheat sold to Bolivia under PL480 would be converted from a loan obligation to a gift.

The agricultural sector projects specified in the Program Agreement include (1) Wheat Collection Centers (US\$4.25 million), (2) Integral Cooperatives (US\$4.5 million), (3) Colonization Roads (US\$7.5 million), (4) Agricultural Service Centers (US\$7.0 million), (5) Pesticide Control and Plant Quarantine Program (US\$1.35 million), (6) Rural Development projects sponsored by Departmental Development Corporations (US\$ 17.5 million), (7) Community Conservation and Forestry (US\$2.0 million), (8) Small-Scale Irrigation (US\$2.5 million), (9) Expanded Agricultural Credit for Small Farmers (US\$15.0 million), (10) Secondary School Scholarships for Rural Students (US\$1.0 million), and (11) Rural Development Studies (US\$1.3 million). The two health sector projects include (12) Control of Communicable Disease (US\$9.0 million), and (13) Nutrition Improvement (US\$1.0 million). Finally, a budget of US\$1.1 million was specified for (14) Program Administration.

As ambitious and complex as it may appear, the Bolivian PL480 Title III Program has proven even more complicated in actual practice. Most of the thirteen action projects consist of sub-projects, which at this time collectively exceed 74. The number of sub-projects currently being implemented by the Departmental Development Corporations alone surpass two dozen undertakings in nine departments. There now exist no fewer than ten micro-irrigation sub-projects. There are four major forestry sub-projects, and under these are dozens of rural community nurseries and reforesting activities. In the health sector five disease control and eight nutrition improvement sub-projects have been organized.

Following the García Meza coup, the U.S. Government discontinued further economic assistance to Bolivia, and the last grain shipment under the PL480 Agreement was in August 1980. This brought total Commodity Credit Corporation disbursements to a total of US\$39.2 million, or 52 percent of the total Program commitment. Of this amount, approximately US\$10.9 million worth of local currency generations was lost in two devaluations of the Bolivian peso occurring in late 1979 and early 1982. Despite already large cut-backs in both the scope and budgets of ongoing projects, the PL480 Program now faces the grim prospect of covering its 1982 financial commitments to some 26 public and private development institutions, over 75 sub-projects, and possibly in excess of 15,000 of Bolivia's poorest rural households with undisbursed local currency balances valued at less than US\$7.3 million.

B. PURPOSE OF THE EVALUATION

This report on Bolivia's Food for Development Program is the final product of an in-country evaluation conducted by Rural Development Services under contract to the U.S. Department of Agriculture. The contractor was asked to prepare a detailed report covering the following broad topics: (1) Program Administration, including Bolivian staffing and organization, field supervision of projects, field reporting, accounting, etc.; (2) Project Performance, including an appraisal of the Program's impact on rural beneficiaries; (3) Government of Bolivia Compliance with "Self-Help Measures" and "Policy Commitments" described in the Program Agreement, (4) An Appraisal of the Program's 1980 Annual Report, for accuracy and completeness; and (5) Recommendations for Improving Program Effectiveness.

The evaluation was contracted for the period January 9 thru March 31, 1982. Fieldwork in Bolivia was conducted during January and early February. Different members of the evaluation team wrote individual chapters of the report or prepared summaries of their findings during mid-to late February at different locations in the U.S. The final report was assembled, edited, translated, and printed in New York by Rural Development Services during the month of March.

C. METHODOLOGY AND PARTICIPANTS

1. Institutional Evaluation

To address the tasks outlined above, the contractor devised a methodology consisting of two separate but complimentary approaches. The first was a conventional institutional evaluation, conducted from the top-down by expatriate professionals. This group of evaluators conducted a review of available documents and files. They met with U.S. and Bolivian Government representatives, and held lengthy discussions with staff of the PL480 Program's Executive Secretariat. They extensively interviewed the staff of individual PL480-financed projects, both at the national as well as (predominantly) the regional level. They made field visits to dozens of rural communities to gather first-hand impressions of project performance from beneficiaries and lowest-level field staff.

Five individuals participated in the institutional evaluation. RDS Associate Michael Hanrahan was the principal investigator and resident director of data collection activities in Bolivia. He was the principal author of Chapters III and IV of this report. Nancy Hirschhorn, representing USDA/FAS, participated in most of the field trips, and her notes contributed importantly to the write-up for at least half a dozen major projects. Gerald Faich, a physician recruited by AID/OIH, joined the team mid-way during in-country evaluation to assess the Program's health sector projects. His report is presented in Chapter V, along with a description by Nancy Hirschhorn of nutrition projects. Charles Connolly, representing AID/Washington, addressed the subject of GOB compliance with self-help measures and policy commitments, and his findings conclude the report in Chapter VI. Finally, John Hatch, RDS President and primary contractor, coordinated the overall evaluation effort, trained Bolivian farmers who participated in the Impact Evaluation (see below), edited the final report, and wrote Chapters I, II, and pieces of other sections.

2. Impact Evaluation by Bolivian Campesinos

The second approach devised by the contractor was highly unconventional. Eleven authentic campesinos were hired (3 women and 8 men), all sharing roughly the same socio-economic characteristics as the intended beneficiaries of the Title III Program. A list of their names and personal background information on each of the campesino staff is presented in Annex D. These indigenous evaluators were trained to interview project beneficiaries in their native language--be it Quechua, Aymara, or Spanish--in order to collect their candid opinions regarding project benefits, weaknesses, and recommendations for improvement.

Each campesino was contracted for an assignment of 10-20 days in a given region, covering one or more projects, and assigned an interview quota. He or she was paid an average of US\$12 per day plus expenses, and each was given their own notebook and pen with which to record beneficiary responses (in Spanish).

Two Bolivian professionals--Marina Ortúñoz Civera and José Victor Morales--were assigned to supervise the field work of campesino staff. Both come from small farm backgrounds, speak the indigenous languages, and have been working on other assignments for Rural Development Services in Bolivia during the last two years. In addition to their supervision functions, Ortúñoz and Morales conducted community-level interviews themselves as time permitted. They also assisted in tabulating, summarizing, and analyzing the content of the notebooks collected by the campesinos--a task they efficiently completed in three days.

Collectively, the campesinos and their supervisors collected impact data on 13 different projects, interviewed 227 rural beneficiaries from 104 communities, and visited 15 rural health institutions. Their field travel took them (during the rainy season no less) to five departments and 25 provinces scattered throughout the highlands, middle valleys, and tropical lowlands regions. A list of all persons contacted, by project and by community, is presented in Annex B.

The impact evaluation yielded excellent insights into project performance and served to greatly enrich the understanding by the expatriate evaluators of Program significance. All chapter sections in the body of the report entitled "Findings at the User Level" are based on data generated by the Bolivian staff. To our knowledge this was the first time in Bolivia (and possibly Latin America) that campesinos were integrated as paid members of an external evaluation team contracted by the U.S. Government. We believe this methodological innovation can be regarded as one of the most significant products of the evaluation itself.

D. SUMMARY OF FINDINGS: PROGRAM AND PROJECT STRENGTHS

Overall, the evaluation found the Bolivian PL480 Title III Program to be an outstanding development undertaking, possibly the best-administered and most widely beneficial rural development program we have witnessed anywhere in the Third World. Its chief features are stellar management, speed, flexibility, local control, sensitive project design, and the delivery of a high volume of development services to the most deprived sectors of the rural population. Among that population, many PL480-financed projects enjoy extraordinary user acceptance.

1. Program Administration

The Program's general administration lies with the Executive Secretariat. This unit is staffed by eleven experienced and highly competent Bolivian professionals; of these, ten have been involved with the Program since its inception. The Program's accounting system is in perfect order, completely up-to-date, and has never received an audit objection. Financial reporting is monthly and invariably completed within a few days of the end of the month reported. Reconciliation of accounts between the Program and project levels occurs trimestrally. Comprehensive budget controls are in place for both Program and project expenditures. The meticulous ordering of vouchers, bank statements, and other financial records--all bound and indexed--is an accountant's dream.

All financed projects are subjected to rigorous design review, and the Secretariat's competent technical staff participates actively with project staff in the detailed formulation of proposals. Field supervision of project implementation is continuously maintained by the Secretariat. In 1981 alone 78 field trips took place involving 374 person-days of PL480 staff time, and all projects or sub-projects were visited at least once.

2. View of the Secretariat by Project Agencies

Accustomed to the excruciating slowness of Government bureaucracies, PL480 project implementing agencies regard the Secretariat with undisguised awe--for its speed and administrative ease, the commitment of its staff, the efficient supervision of projects, and the general reliability of funding. In their institutional interviews, agency staff described their dealings with the Secretariat with such words as "agile", "rapid", "flexible", "easy to deal with", "sensible", "dynamic", "efficient", "good for the country", and even "miraculous".

3. Project Impact

Almost all projects on which impact evaluation data was collected reported a preponderance of positive responses--sometimes lopsidely so--over neutral or negative opinions regarding project benefits received by participating rural households. Increased cash income and improved yields were the most commonly-mentioned benefits, but many intangible gains were also frequently reported: for example, an enhanced sense of welfare, security, and health; or improved aspirations for the future; or a greater legacy for their children; or greater self-worth.

PL480 projects have created enormous expectations at the user level, as well as a high demand for the continuance and expansion of the services provided. For most beneficiaries the PL480 Program represents their

very first opportunity ever to receive assistance from an external source, public or private. This fact offers grim testimony of how massive the problem of Bolivia's rural poverty really is, and of the shallow reach of Government services established to serve the rural poor. For example, less than 5 percent of the Nation's peasant farmers have ever received an agricultural bank loan, or received a farm visit by an extension agent. Thus, PL480 have awakened an intense demand for follow-on services and technical assistance.

4. Project Spread Effects

Most observed projects have had impact well beyond the initial rural communities benefitted. It does not take long for a successful idea adopted by one peasant farmer to be copied by his neighbor. Projects proven effective in one community immediately induce other communities to desire the same thing. In Bolivia, a good project is like setting a match to a dry field. Thus, success is not just a story with a happy ending; it is the beginning of a process.

To initiate such a process and then abandon it is, from a humanitarian perspective, a very lamentable act. By cutting off further support to the PL480 Program in mid-1980, the U.S. Government did not really punish the García Meza regime. Instead it punished potentially tens of thousands of Bolivian campesinos who otherwise would have benefitted from some of the most effective projects ever made available to that nation's rural poor.

5. Departmental Development Corporations

Of the panoply of public and private sector agencies implementing PL480 financed projects, the most stellar performances have been contributed by the Departmental Development Corporations. The operations of these decentralized, semi-autonomous regional development agencies are characterized by independent budgets, local accountability, well-paid staff with high morale and lifelong familiarity with regional problems, and projects that are well-designed, perceptive of local needs, encourage active community involvement, and are routinely well-monitored and administered.

When the PL480 Program began, the DDCs were fairly young institutions only marginally involved in the agricultural sector. But today--in part due to the inducement of complimentary PL480 funding for rural projects --the Corporations now spend a major and increasing share of their budgets on investments benefitting farm communities.

6. Small is Beautiful

One of the primary lessons to be drawn from successful PL480-funded projects is that some of the most dramatically beneficial projects were also among the least expensive. Examples include forestation, fishponds, scholarships for rural students, and rural vaccination campaigns. In other words, a few hundred dollars worth of resources sensitively invested in a Bolivian village or a campesino organization can generate impressive impact. Aside from the direct benefits --improved income or physical welfare--there are important attitudinal changes which diminish fatalism and encourage local initiative. Moreover, smaller projects tend to generate greater opportunities for villagers to actively participate in project design, implementation, and replication to neighboring communities.

E. SUMMARY OF FINDINGS: PROGRAM AND PROJECT WEAKNESSES

Despite its demonstrated success and excellent administration, the PL480 Program is actually quite vulnerable at the present time. Its continuity beyond 1982 can simply not yet be taken for granted. The Program has been badly damaged by the triple shocks of the cutoff in U.S. wheat shipments, by two currency devaluation losses totaling US\$10 million, and by a domestic inflation rate of 60-90 percent annually which has ravaged project budgets. Future losses through additional devaluations would appear imminent in the face of skyrocketing black market rates for dollars. Added to this has been almost continuous political instability combined with GOB austerity measures which have contributed to the collapse of counterpart funding to a variety of Title III projects administered by Government ministries. Another added burden for the Secretariat has been USAID requests to reprogram already-scarce PL480 fund balances to support major new development initiatives not contemplated in the Program Agreement.

1. Uncertain Funding

The cutoff in U.S. wheat shipments to the PL480 Program in mid-1980 had eventually dire repercussions. Lacking any assurance of when or if CCC disbursements would be resumed, the Executive Secretariat began to create forced savings by cutting back project budgets and implementation targets. During 1980 and 1981, the Secretariat managed to create a resource reserve of undisbursed peso funds valued at US\$17.3 million--an amount sufficient to finance 18-24 months of Program operations at a reduced level. However, in response to considerable pressure from the International Monetary Fund and major donor agencies, the Government of Bolivia on February 5, 1982 devalued the peso from 24 to 44 per dollar. Overnight the dollar value of the Program's

resource pool shrunk to US\$7.3 million. This amount is insufficient to meet the current funding requirements of PL480 projects in 1982 --even if only the most deserving and successful projects are considered. Further cutbacks in project budgets and coverage appear inevitable in the short-run (i.e., the next 12-18 months) until new currency proceeds from renewed wheat shipments are available. Meanwhile, the threat of further devaluation losses hangs over the Program like the sword of Damocles.

2. Inflation and Other Economic Difficulties

The 1982 devaluation was not the first time the Program experienced a major drain of its resources. In November 1979 an earlier devaluation of the peso from 20 to 25 per dollar resulted in the loss of US\$950,000 in the value of local currency generations. Other economic policies quickly followed to cause great stress to Program and project budgets, namely: (1) a mandatory 8-20 percent "inflation compensation" allowance for all public sector employees; (2) an authorized 40 percent increase in construction costs, decreed in March 1980; (3) an authorized 50 percent increase in gasoline and other fuels, plus a 40 percent increase in all air and surface transport fares--both decrees in January 1981; and (4) an additional 17 percent increase in construction costs, authorized in July 1981. Undoubtedly, as this report is being written a new spiral of price increases and GOB measures for dealing with the economic crisis are being placed in effect.

3. Political Instability

The PL480 Program supports a variety of public sector projects through three major GOB agencies or their decentralized agencies. These are (1) the Ministry of Agriculture and Campesino Affairs (MACA)--which involves colonization roads, service centers, pesticide control, irrigation, and some forestation projects; (2) the Ministry of Industry, Commerce, and Tourism (MICT--involving wheat collection centers; and (3) the Ministry of Health and Social Welfare (MPSSP)--involving five communicable disease control sub-projects.

Since the inception of the PL480 Program, there have been 7 changes of ministers and 16 changes of sub-secretaries in MACA. There have been 5 different ministers and 15 sub-secretaries in MICT. And in MPSSP there have been 8 changes of ministers and 13 changes of sub-secretaries. Such acute instability has seriously hindered GOB counterpart funding commitments to, and other support for, projects sponsored with PL480 funding.

4. Compliance With Self-Help Measures and Policy Commitments

The Government of Bolivia's record in this area has been modest to poor. That any compliance has been possible at all, given prevailing political and economic conditions, is rather remarkable. Considering the eight self-help measures first, the GOB achieved at least partial compliance on five. The plant quarantine program was strengthened, small farmer credit was expanded, some upgrading of agricultural research occurred, agricultural statistics continued to improve, and to incentivize production the domestic price of wheat was doubled. However, not a single farm service center was constructed (although 18 were designed), no expansion of integral cooperatives occurred, and there was no visible reform of curriculums in Bolivia's agricultural schools. Nonetheless it bears mentioning that non-compliance with two of the last three self-help measures (farm service centers and integral cooperatives) turned out to be fortuitous in light of the fact that this and other recent evaluations have recommended that no more than four centers and no new cooperatives be implemented in the near future.

In the policy compliance area, only one of four policies could be considered at least predominantly satisfied. The health sector budget does appear to have been maintained in real terms (provided PL480 contributions are included). The mandated doubling in real terms of the agricultural sector budget was not met, nor stands any chance of being met. The reorganization of MACA has not occurred, nor was the IICA reorganization study ever completed to USAID's or GOB satisfaction. There was only very partial compliance in the area of wheat incentives, but little expansion in wheat collection centers or their services was realized.

Once again, non-compliance with two of the four policy commitments turned out to be fortuitous in the opinion of this evaluation. The recommendation of this report is that no real increases in agriculture sector budgets are desireable in the absence of the long-awaited reorganization and decentralization of this ministry. As for the wheat collection centers, MICT has demonstrated its inability to efficiently manage the existing collection centers; to increase the number of centers would only make the administration problem larger.

5. Individual Project Deficiencies

Most faults observed at the project level are relatively trivial compared to the Program's external and domestic obstacles cited above. Detailed treatment of individual project deficiencies are therefore left to the body of the report. For the moment it may be sufficient to observe that the "problem" projects consist of (1) Wheat Collection Centers, (2) Integral Cooperatives, (3) Colonization Roads, and (4) Agricultural Service Centers.

6. Future Projects Pressure

The Executive Secretariat has been requested by the U.S. Mission to undertake a reprogramming of its available funds for the purpose of freeing up all possible monies to support new project initiatives by USAID and the GOB. At the moment, the Mission is very interested in launching a multi-million dollar integrated rural development scheme in the Cochabamba--Santa Cruz "corridor". This initiative is conceived within the framework of a strategy to discourage small farmers from growing coca in the Chapare region. It is also seen as a quid pro quo rewarding the Bolivian Government for its improving track record in the control of narcotics trafficking.

This report is not the place to argue the pros and cons of the proposed Chapare program. It is mentioned here only because the initiative poses serious issues that may critically effect ongoing PL480 Program operations: (1) Can such a scheme be launched by utilizing already-scarce Title III resources without causing unreasonable damage to first-priority PL480 projects?; (2) If so, how many resources could be spared?; (3) Would the Secretariat have the power to disapprove financing for the Chapare or other U.S. Mission initiatives not specifically provided for in the PL480 Program Agreement? These issues are addressed and recommendations made in the following section.

F. SUMMARY OF FINDINGS: RECOMMENDATIONS

1. Principal Recommendation

Judged by the exceptional performance of the Executive Secretariat, and by the many achievements of the large number of projects and institutions it supports, the evaluation finds the PL480 Program to have met and far exceeded the mandates contained in the Title III Food for Development legislation. In all of the Third World, Bolivia's is an exciting and highly successful example of how to run a Title III program. This is a model worthy of study and imitation.

It is therefore recommended that further assistance under the Bolivian PL480 Title III Program Agreement be unfrozen immediately. If at all available, the remaining US\$35.8 million of wheat shipments "owed" to Bolivia should be committed, of which no less than US\$15.0 million should be authorized for delivery during 1982. Furthermore, it is recommended the Program period be extended by an amendment of the Program Agreement to at least December 31, 1984 (and preferably one year later) to provide sufficient time to prudently budget, disburse, and supervise the use of the remainder of the funds.

2. Breakdown in GOB Counterpart Support

Government austerity measures in effect since August 1981 have placed serious restrictions on staff hiring, field travel, use of vehicles, etc. These constraints, when added to normal bureaucratic inertia and the continuous political instability in the ministries have greatly impaired the effectiveness of most (but fortunately not all) GOB-managed PL480 projects. Failures to disburse approved counterpart budgets, inadequate staff for project execution, and lack of field presence are commonplace.

It is recommended that when the Secretariat diagnoses such impaired efficacy, budgetary pressure be used to ameliorate it. In other words, PL480 disbursements to the deficient agency should be discontinued or its Title III budget sharply reduced. When the implementing agency does not respond within a six month period, it is recommended that the project be terminated with that agency, and a different executing agency found. Candidates for this treatment presently include the wheat collection centers (MICT) and the Forestry Corporation (MACA).

3. Similar Projects, Different Approaches

On several projects to date the Secretariat has funded the same activity for more than one implementing agency, and different methodologies of execution have been employed. Examples include forestation, roads, irrigation, and credit projects. It is recommended that the Secretariat conduct an evaluation of the relative effectiveness of the different methodologies employed--at the user level, and in terms of cost per beneficiary or other cost-effectiveness measure. Once the most productive methodologies have been clearly identified, budgetary pressure should be used to cause their general adoption by all agencies implementing the same activity.

4. Training Farmer-Paratechnicians

The awakened demand for follow-on assistance in rural communities benefitted by the PL480 Program, and the rapid intensification of demand for services from neighboring communities not yet served, threatens to overwhelm the available supply of GOB and DDC technicians called upon to meet that demand. It is the conviction of several implementing agencies as well as the evaluators that this growing disequilibrium between service supply and demand can be resolved by the training of large numbers of farmer-paratechnicians for project promotion and supervision functions. The evaluation therefore recommends that the Secretariat set aside a fraction of its available resources (e.g., US\$250,000) to subsidize farmer training activities in ongoing projects, and to pay modest honorariums and incidental expenses incurred in using their services.

Additionally, the Executive Secretariat is urged to consider contracting the services of 3-6 part- or full-time farmer-paratechnicians to assist its technical staff in a wide range of project monitorship and liaison functions. These campesinos would be based in the field but would report to the Secretariat in La Paz at least once a month. The annual cost of this initiative is not expected to exceed US\$15,000.

5. Training Staff from Other Countries

The evaluation recommends that the Bolivian PL480 Program be considered a training site for staff of rural development programs from other countries. Outside visitors have much to learn from studying the Secretariat's accounting system, budget controls, financial and activities reporting, and project review procedures. Visitors would also profit from visits to several of Bolivia's Departmental Development Corporations. Readers of this report are urged to contact the Secretariat directly to arrange for study visits.

6. Specific Project Recommendations

WHEAT MARKETING CENTERS: When it works, this project offers clear benefits to small farmers. Unfortunately, such benefits are presently cancelled out by implementation breakdowns resulting from inept administration by MICT, and by the unreasonably high project costs per ton of wheat collected (US\$382). It is therefore recommended that PL480 funding to MICT for this project be immediately discontinued. The Secretariat is urged to initiate three-way discussions between itself, MICT, and the DDCs to explore ways of transferring the assets and administrative responsibility for existing wheat collection centers to the DDCs. The latter would be asked to study present deficiencies in center operations and present proposals for overcoming them together with a strategy for reaching operating cost-effectiveness and self-sufficiency within three years. Given funding constraints, this is a second-priority project.

INTEGRAL COOPERATIVES: Although not reviewed in depth by this evaluation, limited contacts with staff and review of project documentation suggest that its success is constrained by protracted, and possibly fatal, problems of design (highly technocratic, top-down approach) and implementation (membership conflict, under-capitalization, etc.) It is classified as a second-priority project.

COLONIZATION ROADS: Completion of the Chané-Pirai colonization road has been paralyzed for almost two years because of the contractor's bankruptcy; hence, this project was evaluated only briefly in discussions with Secretariat staff. Since the road's completion has become a condition-precedent for a World Bank IRDP of \$14 million for the Chané region, this project deserves first-priority status. However, the costs of repairing the abandoned roadbed will now be higher than the original project budget. We therefore recommend funding be resumed only after new Program support has been authorized. We recommend against construction of the San Julian Norte road until the Chané-Pirai job is completed.

AGRICULTURAL SERVICE CENTERS: This project originally targeted the construction of 70 service centers, which was later reprogramed to 24. Of these 18 have been designed and construction bids approved for four centers. MACA has been negligent in supporting this project, and virtually all efforts to date have been the result of initiative by the Secretariat. Furthermore, given that MACA has not yet defined a strategy of decentralization and regionalization of its personnel, building service centers is premature. It is therefore recommended that only sufficient funds to complete the construction of the first four centers be reserved for 1982-1983 implementation. All further funding to this project should be discontinued, and future funding consideration should be based on the satisfaction of two prerequisites: (1) the construction of the first four centers has been completed and they are evaluated to be functioning effectively, and (2) the reorganization and decentralization of MACA has been initiated. At this time the evaluation finds farm service centers to be a second-priority project.

PLANT HEALTH AND PESTICIDE CONTROL: PL480 assistance to this project should be continued at Agreement levels. But vigilance must be maintained and budgetary pressure applied, if necessary, to insure that MACA continues to comply with its counterpart support commitments.

FORESTATION: Once implemented, forestation projects enjoy overwhelming user support. Forestation benefits incide entirely upon rural households, to whom they supply fuel, cash income, construction materials, wind and erosion protection, agricultural implements, and many other advantages. It is recommended that assistance to this project continue for the present at no less than Agreement levels, and that funding be increased--at least to DDC projects--when additional PL480 resources become available.

SMALL IRRIGATION SYSTEMS: All executing agencies have managed to identify, design, and execute projects of high local impact. Benefits have fallen to small farmers, who have contributed large amounts of labor, local materials, and cash to these projects. It is recommended that PL480 funding for this project also be continued at no less than Agreement levels, and that funding be increased by US\$1 to \$2.0 million when new Program support is available. Another first priority project.

SMALL FARMER CREDIT AND CROP INSURANCE: This project is the first line of institutional credit (PCPA) to effectively reach large numbers of small Bolivian farmers. It represents a highly significant innovation within the BAB, and PCPA loans enjoy the lowest default rates of all BAB credit lines. All PCPA assistance by U.S. donors is currently suspended due to the 1980 coup and administrative irregularities since corrected. The crop insurance sub-project remains untested. PCPA can not

continue to function within BAB in the absence of donor assistance, but it has functioned with surprising efficiency using reflow funds during the aid suspension. Both programs enjoy strong but not unequivocal user support. Farmer demand for both PCPA loans and crop insurance coverage far exceeds available resources. Benefits generated by these projects include the intensification of land use, increased yields, improved cash income, agronomic technical assistance, and farm or homestead improvements. The suspension of assistance to the PCPA has had a direct, highly negative impact on several thousand small farm families whose access to credit was restricted for lack of funds.

It is recommended that USAID immediately unfreeze its assistance to the PCPA, and that the Executive Secretariat provide the project with as much as it can spare of its remaining US\$7.3 million in local currency resources (i.e., without cutbacks in other first-priority projects) for 1982. As soon as the currency from renewed wheat shipments becomes available, it is recommended that PL480 contributions to the PCPA capital loan fund be increased to US\$14 million. To better serve a greatly-expanded client population, it is recommended that PCPA be urged by the Secretariat to train dozens of farmer-paratechnicians for loan promotion and supervision among the smallest and neediest rural families.

SCHOLARSHIPS FOR RURAL STUDENTS: A total of 850 scholarships have been granted to students from the very poorest rural families. PL480 funding to this project should be at least maintained at present levels until new resources materialize, and then expanded to the Agreement level of US\$1.0 million. This is definitely a first-priority project.

RURAL DEVELOPMENT STUDIES: Only about 7 percent of the Agreement authorized funding for this project has been spent to date--on three studies of high quality. Due to MACA inertia, management of this project has been shifted to the Executive Secretariat. Given current funding constraints, the evaluation considers the project a second-priority undertaking. All expenditures for this project should be postponed until new PL480 funds are available.

CONTROL OF COMMUNICABLE DISEASES: Of all the ministries participating in the PL480 Program, the Ministry of Public Health (MSPPS) has by far the best record in project support and continuity. Of the five health sector sub-projects, three have been remarkably successful: (1) the yellow fever emergency in Santa Cruz has been dealt with effectively and the vector could soon be eradicated; (2) malaria control spraying and surveillance has doubled over the last three years, and malaria incidence has been reduced by 40 percent; (3) the immunization sub-project has established its vaccine distribution system, personnel are now in place and well-trained, and outreach coverage of rural children is improving gradually despite poor access, lack of demand, and indigenous cultural barriers. The two remaining subprojects are advancing,

although haltingly. The investigation of chagas disease faces serious data processing constraints, and some of its methodology is questionable. The tuberculosis sub-project gets high marks for increased detection and diagnosis, but is deficient in follow-up and treatment due to drug scarcity and poor supervision.

It is recommended that PL480 funding to the communicable disease project be sustained at or near Agreement levels. Some economization of resources could be obtained by integrating malaria and yellow fever spraying and surveillance activities.

IMPROVED NUTRITION: This project was implemented by the National Food and Nutrition Institute (INAN), a multi-disciplinary public sector agency under the ministry of planning. INAN has used PL480 funding to subsidize its administration costs (which have now been adsorbed by the GOB), and to finance basic research, education programs, and applied nutrition projects in the production of guinea pigs, rabbits, tarhui, and fish (the latter in conjunction with Departmental Development Corporations). As per the Program Agreement, PL480 financing to this project was for a two-year period only, and the Program's commitment to INAN is now essentially terminated. It is still too early to evaluate the impact of the applied nutrition projects, but continued monitorship of their performance now rests squarely in the best place--with the DDCs. No recommendation for future action with this project is required at this time.

RURAL PROJECTS OF THE DEPARTMENTAL DEVELOPMENT CORPORATIONS: Along with the stellar administration of the Executive Secretariat, the performance of the DDCs constitutes a great pillar of strength sustaining the PL480 Program. The Corporations presently implement at least 24 sub-projects. Only a portion of these (10) could be visited in the field given the time constraints placed on the evaluation. Of these, only one was considered to be of questionable merit in providing benefits for small farmers--the Tarija Poultry project. DDC projects are often small, contain mechanisms for self-sustained growth, encourage local participation, enjoy exceptional user acceptance, and cause high impact at the lowest levels of Bolivian rural society.

It is recommended that for the immediate future the Executive Secretariat do everything in its power to prevent cutbacks in funding to DDC sub-projects during this resource crisis year of 1982. All second- and third priority projects should, if the need arises, relinquish their programmed monies to sustain the level of DDC and other first-priority projects. Given a resumption of wheat shipments in support of the PL480 Program, it is recommended that no less than US\$ 14 million of available funds be programmed for use by the DDCs for the period 1982-1984. This amount would be exclusive of additional resources taken from other executing agencies to support ongoing projects that are transferred to the management of the Corporations.

7. The Chapare Initiative

The evaluators see no short-run possibility of providing significant PL480 funding for the Chapare program, i.e., before 1983. At best limited funds might be released for financing feasibility studies in 1982 but not much else. As of this writing, the PL480 Program has at its disposal local currency valued at no higher than US\$7.3 million as a result of two devaluation losses totaling 28 percent of all resources deposited to the Program. The risks of imminent future devaluations remains high. Meanwhile, escalation of project costs due to 60-90 percent per annum inflation and GOB-mandated increases in construction, travel, and salary costs have further squeezed all ongoing Program activities.

Given a substantial renewal of Program funding by Washington, the Chaparé initiative could perhaps be considered for PL480 funding support in 1983. But in this case, expanded funding to first-priority Title III projects should take precedence over any new programs. In addition, some second-priority PL480 projects must also be given funding right-of-way prior to the Chapare scheme.

This evaluation identifies eight projects of a first-priority nature. Their combined funding requirements, to reach Agreement levels, total US\$34 million for the 1982-1984 period, of which roughly US\$7.3 million currently exists, leaving a net balance of US\$26.7 to be met by renewed funding. These first-priority projects are the following:

-DDC Rural Development Projects:	14,000,000
-Forestation:	750,000
-Small Scale Irrigation	1,700,000
-Small Farmer Credit	10,000,000
-Rural Scholarships	700,000
-Control of Communicable Diseases	5,900,000
-Plant Health and Pesticide Control	550,000
-Program Administration	400,000
	<hr/>
	US\$34,000,000

To these should be added several second-priority projects, most of them intrinsically valid, particularly if placed under a new implementing agency or otherwise reformed. A tentative allocation of resources at reduced funding (not Agreement levels) is suggested as follows:

-Wheat Collection Centers (under DDCs)	1,000,000
-Colonization Roads (Chané-Pirai only)	3,000,000
-Integral Cooperatives	100,000
-Rural Development Studies	200,000
	<hr/>
	US\$ 4,300,000

The above desireable funding estimates total US\$38.3 million, of which US\$7.3 currently exists, leaving a net funding requirement of US\$31.0 million. Theoretically, if Washington approved a full restoration of Program support as specified in the Agreement--i.e., the remaining US\$35.8 million--this would create a potential surplus for meeting new program initiatives and contingencies of US\$4.8 million.

The evaluation finds, therefore, that the financing of the Chapare with PL480 resources will first of all depend on Washington, not the Secretariat. Granted that nearly all Program support is restored, it then becomes relevant to address the issue of whether the Secretariat has the authority to accept or disapprove a new initiative such as the Chapare initiated by the U.S. Mission rather than a Bolivian institution. To minimize a confrontation on this question, the evaluators suggest that USAID seek the active involvement of Secretariat staff in the research and design of any Chapare program. A program formulated exclusively by expatriate consultants would clearly not be appropriate. It furthermore would appear expedient to consider both CORDECO and CORDEPAZ as joint co-administrators of such a program.

III. PROGRAM ADMINISTRATION

This chapter describes the operations of the PL480 Executive Secretariat. It covers staffing, accounting records, financial controls, project review procedures, field supervision of projects, project-level perceptions of the Secretariat, and an appraisal of the Program's Annual Reports. John Hatch researched and wrote the chapter, with contributions from Michael Hanrahan for the section project-level perception.

A. FINANCIAL OVERVIEW

Through August 1980, when the last grain shipment to the Program was authorized, total disbursements by the Commodity Credit Corporation had reached US\$39,159,608--leaving a "frozen" balance due of US\$35,840,392 to reach the total US\$75 million specified in the Program Agreement.

Of total CCC disbursements, as of September 1981 some US\$38,391,998 or 98 percent had been deposited in the Special Account of the PL480 Program located in the Central Bank. As of December 31, 1981, total expenditures under the Program had reached US\$20,915,000 or 54 percent of local currency deposited to the Special Account. However, the Program experienced two serious currency depreciation losses: the first in November 1979, when the peso was devaluated from 20.4 to 25 per dollar; and the second in February 1982, when the peso was devalued again from 25 to 44 per dollar. Together these depreciation losses total 28 percent of all resources deposited to the Program.

With the cutoff in funding support to the PL480 Program in 1980, the Executive Secretariat began to conduct reductions in the budgets and implementation targets of ongoing projects so that--through forced savings--it might create a reserve for maintaining project operations through 1981, 1982, and possibly beyond. In pursuit of this wise and responsible decision, the Secretariat managed to create a reserve of US\$17.3 million worth of local currency by the beginning of 1982. Although the Secretariat had repeatedly requested Mission and Washington authorization to invest unused local currency in an interest bearing account in order to generate additional Program income as a hedge against inflation and devaluation risks, approval was never granted. Thus, the February 1982 devaluation caught the Program in a totally unprotected position which resulted in a devastating overnight loss of US\$10 million.

The moral responsibility for this disaster lies mainly with the U.S. Government, whose funding support cutoff made forced savings necessary in the first place, and whose subsequent inaction in supporting Program efforts to protect those savings exposed them to destruction. The loss of almost US\$11 million in Program resources to date must be seen as an unspeakable tragedy for Bolivia. Tens of thousands of that nation's poorest rural households would have been greatly benefitted from projects financed with that money.

B. STAFFING OF THE EXECUTIVE SECRETARIAT

At present the Executive Secretariat manages the overall Program and monitors thirteen action projects plus over 74 sub-projects with a small staff of eleven professionals, two secretaries, two drivers, a messenger-watchman, and a maid. This personnel is headquartered on the ninth floor of a modest but modern office building in downtown La Paz--located conveniently within 1-4 blocks of the American Embassy, USAID, and the principal Government ministries with which the Program works. On the fifth floor of the same building the Secretariat supports four additional professionals (two architects, a civil engineer, and an accountant) who are assigned to the Service Center Project. Also closely managed out of the office of the Secretariat is a team of irrigation engineers which have been detached from the National Community Development Service to work exclusively with PL480-financed small scale irrigation projects.

The Secretariat's core staff is highly experienced. Of the present eleven professionals, all but one has been with the organization since its inception. The Executive Secretary himself, Fadrique Muñoz, has over 24 years of experience in public service, including cabinet level responsibility. He is supported by an Administrative Officer, Felipe Contreras, who has many years of accounting experience with the projects of USAID and other foreign donors in Bolivia. The Program's agronomic specialist, Gober Barja, is a former sub-secretary and career officer of MACA, who has worked with several generations of USAID staff. The Secretariat also boasts three young but very competent economists (José Sanjinés, Reynaldo Marconi, and Jorge Noda), a practicing physician (René Zumarán), a Plant Pathologist (Regina Iberkleid), and a civil engineer (Germán Uriarte).

It is the younger staff members that carry most of the burden of project supervision in the field. They travel often (see below), their knowledge of projects monitored is comprehensive, they demonstrate a strong sense of commitment to project beneficiaries, and they cooperate very well with each other.

The strong field orientation of younger Secretariat staff has sometimes resulted in situations of frustration with senior staff. Often, upon returning from project visits where they have acquired new experience and insights, they complain that their initiatives are not given a reasonable hearing by the Executive Secretary. The hierarchical organization of the Secretariat is in fact a bit too rigid, which discourages adequate internal dialogue. Risk taking and creative Program ideas that go considerably beyond the terms of the Program Agreement are not encouraged in today's Secretariat. Indeed, this is the only real deficiency the evaluators encountered in that unit's operations. However, such "conservatism" is perfectly understandable considering the highly uncertain financial situation which the Program faces. In essence, the Secretariat's younger staff members are saying: "We have a good program, but we can still do more"; and to this senior staff replies: "With what resources?"

C. ACCOUNTING RECORDS AND FINANCIAL CONTROLS

In public sector development programs it is commonplace to encounter even computer-assisted accounting systems that run one or more months behind schedule. It therefore comes as a pleasant surprise to find that Bolivia's PL480 Program--covering dozens of major and minor projects, and implemented in a setting of economic and political chaos--is completely up-to-date.

The Secretariat issues its monthly balance sheet, income statement, financial report to USAID, and bank account conciliation within no later than ten days (and normally less than a week) after the end of the month for which operations are reported. The Secretariat maintains a comprehensive budget control ledger--employing the official GOB accounting codes--which on any given day allows Program management to know the exact fund balances remaining in all current year administrative operating budget accounts. Also maintained up-to-date is a budget control card file for every project and sub-project in the PL480 Program, and each card contains all income and expenditures by that project activity as they occur.

The organization and filing of accounting records is an auditor's dream. For every expenditure ever made by the Secretariat--for Program management or disbursements to projects--there exists an official voucher which has been stamped approved by the DCCP, the Government agency (a sub-treasury of the Ministry of Finance) entrusted with financial monitorship of foreign donor-funded programs. The acronym DCCP stands for the Department of Project Control and Coordination. Similarly, each PL480 project reports all expenditures with official DCCP-reviewed vouchers submitted quarterly to the Secretariat. All vouchers

and other relevant financial documentation of possible interest to auditors have been bound in hard cover--and indexed by month--for the first 31 months of Program operations (March 1979 through September 1981). Secretariat bank statements and all movement of income to and expenditures from the Special Account are similarly bound and indexed.

Every three months all Secretariat system figures are reconciled with those of each individual project. All projects are required to employ a standardized accounting manual mandated by DCCP. In a recent audit* of the Program completed for the period March 1979 through March 1981, the external auditors made only 14 observations covering a Program embracing over 75 project activities for which accounting records are kept. Of these observations, only three were considered serious oversights: in the Bolivian Agricultural Bank a co-mingling of PL480 funds in a central bank account and an unsupported reserve for uncollectable loans (since resolved); and in the Ministry of Health an inadequately documented equipment importation. Even though the auditors managed to find fault with the Central Bank, their most serious (and only) observation of the Secretariat's own operations was the absence of a letter of understanding in the file of one project.

In three years of operations the PL480 Program has never received an observation of discrepancy from the DCCP. Since Program inception neither has there ever been a discrepancy between PL480's checkbook balance and its monthly bank statement. Furthermore, the Secretariat has never spent more than its approved annual budget for Program management; in fact, of its budgeted funds, after three years the Secretariat has saved 2.4 million pesos (US\$96,000 at the old exchange rate) by spending under-budget for operating expenses.

RECOMMENDATION: The Secretariat's remarkably efficient accounting system is maintained by the PL480 Administrative Officer and a part-time accountant; it is kept perfectly up-to-date without the assistance of a computer. The evaluators believe this system offers a model worthy of study and possible imitation by development programs elsewhere in the Third World. It is recommended to USAID, USDA, other international donors, and their clients that direct arrangements be made with the Bolivian PL480 Executive Secretariat to receive visitors or observers who would work as interns in the La Paz office for periods of 2-4 weeks to study how the Bolivian model operates.

* Hugo Berthin Amengual y Asociados Ltd., Oficina de Auditoria, Auditing Report of the Programme PL480 Title III for the Period Between March 1, 1979--March 31, 1981.

D. PROJECT REVIEW PROCEDURES

The Executive Secretariat does not design projects per se; rather, it reviews project proposals presented by the Departmental Development Corporations, Government ministries, and other client institutions. In the early days of the Program, Secretariat staff was forced to engage in a great deal of prodding and motivating to get other agencies to submit project proposals. This has long ceased to be a problem, and today the opposite extreme has been reached: the PL480 Program is now receiving numerous verbal inquiries on a daily basis as well as unsolicited written proposals that must be flatly turned down for lack of available resources. Part of this unnecessary pressure has been gratuitously created by USAID/Bolivia, which routinely redirects many host country assistance requests to the Secretariat. "Go talk to Don Fadrique," USAID suggests to fund seekers, "...He's the only one with any money these days." By the same token, without imminent prospects for a significant recuperation of its own formerly-abundant levels of funding, USAID itself looks to the PL480 Program as a ready source of quick-and-easy financing for its own newest development initiatives.

RECOMMENDATION: Given the current scarcity of PL480 resources, and in the absence of a firm commitment by Washington to restore funding support to the Program at Agreement-levels, USAID's encouraging host country fund seekers to seek assistance from the PL480 Program is clearly inappropriate. It causes a disservice to the Program by needlessly distracting the time of Secretariat staff, forces them to repeatedly play the villain role, and builds up host country expectations so they can be dashed. It is recommended that USAID staff refrain from sending new clients to the Secretariat until PL480 funding perspectives are clarified.

Although the Secretariat has no resources to consider new project proposals at present, it does have an extremely effective system for reviewing them, a system which has been rigorously applied to all projects submitted for Program consideration since the organization of the Secretariat itself. Unfortunately, several of its current projects were designed before the Secretariat was organized. Some were USAID shelf projects; others were the brainstorms of USAID staff now long-departed. These projects were scoped out and built into the Program Agreement, thus becoming a fait accompli for the Secretariat to accept without critical technical review. Sadly, most of these projects have faltered badly. Examples include (1) Wheat Collection Centers, (2) Integral Cooperatives, (3) Colonization Roads, and (5) the Tarija Poultry scheme, one of the very first DDC projects..

Normally, however, the Secretariat first requires from a potential client institution the submission of a "Project Profile", usually a 5-10 page document similar to a concept paper or pre-feasibility study. Guidelines for the preparation of these profiles are provided by the Secretariat. Once presented, the Secretariat reviews the profile for consistency with Program selection criteria--e.g., serves the poorest strata of the rural population, generates benefits for broad numbers of beneficiaries, is cost-effective, requests funding support compatible with available resources, pledges a significant counterpart contribution, is self-sustaining, technically feasible, etc. This up-front profile review allows the Secretariat to turn down many proposals at an early stage before the client has invested unreasonable design effort. However, once the profile is approved, a very detailed project proposal is required. Often a fairly sophisticated cost-benefit projection and cash flow analysis is required.

Usually the Secretariat's staff will participate actively with a potential client in the project design process. A field trip to the intended project site, conversations with potential beneficiaries, repeated discussions with client agency staff, and one or more meetings during the final design stage to correct final flaws in the proposal--all these tasks constitute standard procedure for the Secretariat. Once reviewed and approved by the Secretariat, the project proposal is submitted to USAID for its review. Since the inception of the Program, USAID has never turned down a project--nor disapproved an implementation letter --submitted to it by the Secretariat.

New projects are normally approved late in the year. This allows the Secretariat to incorporate the financial requirements of new activities into the Program budgeting exercise for the following year. Once approved, the project is assigned a specialized reporting format, its performance indicators are specified, and a detailed implementation plan is prepared. An accounting manual specifying DCCP and Secretariat financial record-keeping and reporting procedures is given to the agency executing the project. A separate accounting system for PL480 financing is established. Thereafter, routine field monitoring activities commence (see next section). When deficiencies are detected, trimestral project budget disbursements are frozen until the fault is corrected to the Secretariat's satisfaction.

E. FIELD SUPERVISION OF PROJECTS

In the development business the most critical constraint is seldom a deficit of promising ideas--which often abound a dime a dozen--nor is it always an insufficiency of material or human resources. What counts the most is the capacity to carry good ideas into practice, even if only on a diminutive scale. And here, perhaps the most common shortcoming is the lack of continuous project follow-up, i.e., the lack of frequent and timely project monitorship in the field. Happily, this type of commitment is one of the salient strengths of the Executive Secretariat of the PL480 Title III Program.

With the wholehearted cooperation of the Secretariat's Administrative Officer and several technical staff, the evaluators reviewed the performance of PL480 personnel in conducting project supervision in the field. The results of that investigation were nothing short of remarkable. During 1981, Secretariat staff members conducted a total of 78 field trips, or an average of between six and seven trips per month. These field visits occupied 374 person-days of staff time, for an average of almost five days per trip. Of the 13 major ongoing projects, all but two were listed as being visited--Colonization Roads and Agricultural Service Centers--and these were neglected for obvious reasons: the road project had been paralyzed for two years due to insolvency of the contractor, whereas not a single service center had entered the construction stage (despite the fact that the Secretariat has itself offered MACA its choice of 18 completed prototype blueprints to work with).

On an individual project basis the frequency of supervisory visits was most impressive. The Wheat Collection Centers received ten visits, Integral Cooperatives five, Forestation sub-projects six, Small Scale Irrigation 16 visits, Small Farmer Credit five, Rural Development Studies four, Malaria Control sub-project six, Immunizations sub-project six, Yellow Fever sub-project two, Nutrition sub-projects five, and sub-projects of the Departmental Development Corporations a total of 56 visits. In this last category there are presently 25 DDC sub-projects, of which all but four were visited at least once; six of them were visited on three or more occasions.

What the above figures do not adequately reflect is the degree of difficulty in reaching many of these projects and sub-projects. They are located in all three geographical regions of Bolivia--highlands, temperate valleys, and tropical lowlands--and all nine departments. Coverage is expensive, both in transport costs and staff time, because most projects outside the Department of La Paz require air travel followed by several hours of surface transportation on unpaved roads. During the

rainy season (which was when this evaluation was conducted) surface travel time requirements often are doubled or tripled, while air connections to the lowland departments of Beni and Pando become extremely infrequent: a cancelled flight can leave a visitor stranded in the lowlands for weeks.

The Program's rapidly growing number of DDC sub-projects has begun to place a serious strain on Secretariat technical staff to maintain adequate standards of field monitorship. Many of these sub-projects are quite small, very inexpensive, and located in relatively remote areas which require the most time to reach. In response to this dilemma there has been recent internal discussions within the Secretariat regarding the expediency of financing fewer but more expensive projects --for example, financing a dam and irrigation system serving ten communities and 1,000 hectares rather than a minuscule cutwater and canal system serving 20 families and 50 hectares. In the opinion of the evaluators, such a shift in project criteria favoring bigger undertakings would be unfortunate, particularly if it was made to reduce management supervision costs per beneficiary. It is precisely the smaller projects that offer the greatest opportunities for maximum local participation in project design, management, and technical decision-making in general. These projects being much less expensive are also far less risky as "starter" undertakings for introducing rural villages to the heady experience of self-help community development based on an injection of external resources. Small community projects are also more readily imitated, creating a spread effect. To our minds, one of the principal strengths of the DDC sub-projects is that they tend, indeed, to be smaller--and hence more controllable by the beneficiaries for whom the project was implemented.

RECOMMENDATION: In the last analysis, current project monitorship standards can be maintained or even improved if the Secretariat were to recruit and train a cadre of farmer-paratechnicians to assist with project promotion and supervision responsibilities. These would be based in the regions but report to the La Paz office on at least a monthly basis. PL480 professional staff is not paid to spend endless hours riding in jeeps or walking to and from projects; its job is to analyze, guide, teach, solve problems, evaluate results. Many project supervision functions can be taught to people with no high school or college training. Better still, by working as counterparts to professionals, farmer-paratechnicians will gradually acquire many technical and analytical skills, thereby broadening the quality of the leadership pool in rural Bolivia. Best of all, a farmer-paratechnician comes cheap. He/she might earn US\$ 25-50 per month for part-time work, US\$50-100/month for full-time work --plus expenses. The evaluation recommends the Secretariat experiment with the paratechnician concept, hiring perhaps six individuals at the beginning and allowing the innovation, if successful, to evolve at its own pace in the most productive directions.

F. PROJECT-LEVEL PERCEPTIONS OF THE EXECUTIVE SECRETARIAT

During the Institutional Evaluation interviews, personnel at over 26 offices of different implementing agencies were asked to comment on their relations with the Executive Secretariat, and on the PL480 Program in general. Almost without exception their comments were laudatory. The Title III Program was characterized as fast, flexible, easy to deal with, sensible, dynamic, positive, efficient, good for the country, and even "miraculous". Agil (agile) was the word used repeatedly, regardless of geographical location or project. The general character of the working relationship was described as cordial and close, with few disagreements. Supervision was seen as amiable and frequent. Title III staff were described as competent, friendly, and easy to deal with.

Advantages of the Program were numerous. The project application and approval process was described as easy and rapid. Ministry headquarters, the Controlería, the Fiscal, and the Treasury could be avoided. The program administrative services were efficiently managed. Disbursals were rapid. The Program permitted a number of implementers to reach directly to the poorest sectors of the rural population in ways their other on-going operations did not permit. The breadth, scope, and flexibility of Title III permitted the widest range of project activity as well as the adaptation of project approaches to a large variety of rural needs. Indeed, two institutions said they no longer attempted to work with Government ministeries, but of all the donors they did work with the PL480 Program was preferred over all others.

Few problems were cited but deserve mention. Both trimestral financial and project activities reports were characterized as lengthy, detailed, and time-consuming. However, Title III reporting procedures were preferable to those required by the ministries. Several agencies requested that the PL480 Program raise the maximum amount financed to above US\$ 1.0 million. Two institutions did not like the preparation of shelf projects. In general these were isolated comments, however. The great bulk of opinion was that Title III is the best rural development program in Bolivia.

G. AN APPRAISAL OF THE PROGRAM'S ANNUAL REPORTS

The Annual Reports of the PL480 Program are among the most comprehensive, detailed, and insightfully written documents that the evaluators have encountered in public sector development programs of the Third World. Despite their great length, they have been completed punctually within a month or two of the end of each fiscal year. The accuracy of the figures used in the Annual Reports is high; errors encountered by

the evaluators have invariably been typographical or otherwise unintentional, never malicious.

Perhaps the most reassuring aspect of the Annual Report is that it is backed-up by an extensive Program filing and memory system which is totally reliable and often awesome in its comprehensiveness. The financial records are totally beyond reproof, as described in a previous section. Additionally, each of the projects and sub-projects has an individual ring-binder file in which is stored (1) all correspondence pertaining to the project, (2) the project profile, (3) the definitive project proposal, (4) the annual implementation plan, performance targets, and budget, (5) trimestral project activities reports, (6) field trip monitoring reports on the project, (6) any evaluation report prepared on project activities, and (7) miscellaneous documents of interest.

Moreover, the Secretariat maintains this Program memory in duplicate --one copy for technical staff use, one copy for the administrative staff. The Executive Secretary also keeps a detailed photo album of pictures describing each project and sub-project. While the quality of the photographs is not the best, nor the subject matter captured with much of an artistic eye, the photos are extremely useful in giving outside visitors a fairly accurate set of images of the Program and its component sub-projects.

Because the Annual Report receives fairly wide domestic circulation among the ministries in La Paz, the document tends to be written in a diplomatic style which, at times, lends a less than accurate impression of how seriously deficient the support for, and performance of, many GOB-managed projects has been. Nonetheless, the Secretariat's Annual Report authors occassionally make rather candidly critical observations of project deficiencies. Whenever this occurs, one can be assured the problem is thoroughly documented and a matter of common knowledge among staff of the criticized institution.

Perhaps it is appropriate to mention a rather trivial deficiency encountered by the evaluators in PL480 Annual Reports. The headings on charts listing lists of projects, their budgets, and expenditures for given periods are frequently too ambiguous to allow the reader to know whether reference is made to the calendar year or the fiscal year, which runs October 1 through September 30th. For example, when a chart says "Accumulated Expenditures 1979-1981, does this mean expenditures through September 1981 or does it also include the last three months as well? More careful attention to the dating of all charts and statistical summaries is recommended.

IMAGES OF THE EVALUATION: INTERVIEWERS AND RESPONDENTS



1. Participants in a forestation activity in Cochabamba answering questions by a Quechua-speaking evaluator.



2. A campesina evaluator interviews an Aymara woman in the Altiplano village of Huacuyo about her use of public health services.

I I I. P E R F O R M A N C E O F S P E C I F I C P R O J E C T S

This chapter covers all but one of the eleven agricultural sector projects supported by PL480 financing. The work of the Departmental Development Corporations with their over two dozen sub-projects will be described in the following chapter. Of the ten projects reviewed here, all but one were initiated as GOB-managed undertakings, either by ministries or their decentralized agencies. The projects covered are (1) Wheat Collection Centers, (2) Integral Cooperatives, (3) Colonization Roads, (4) Agricultural Service Centers, (5) Plant Health and Pesticide Control, (6) Forestation, (7) Small Scale Irrigation, (8) Small Farmer Credit, (9) Scholarships for Rural Students, and (10) Rural Development Studies.

Most of the projects which were reviewed in depth follow a standardized descriptive format. First, a general description of project operations is provided--its purpose and objectives, activities, achievements, and funding. The second section covers findings about the project obtained in the institutional interviews conducted by expatriate evaluators. Next are provided the findings at the user level, if any, which are based on the impact evaluation conducted by campesino staff. Each project review concludes with recommendations regarding possible improvements in project operations or suggestions about funding.

This chapter was researched mainly by Michael Hanrahan and Nancy Hirschhorn. The write-up was predominantly Hanrahan's in consultation with written comments by Hirschhorn. However, the section on Integral Cooperatives was prepared by Hirschhorn and the section on Agricultural Service Centers by John Hatch.

A. WHEAT COLLECTION CENTERS

The PL480 Title III Program supports improvements and operating capital in six existing wheat collection centers and was initially designed to support the construction of at least eight new centers. The Wheat Marketing Division (WMD) of the Ministry of Industry, Commerce, and Tourism (MICT) is the sole executing agency.

During the in-country evaluation, institutional interviews were conducted with WMD's National Director in La Paz, WMD Departmental Direc-

tors in Cochabamba, Sucre, and Tarija, and with the Marketing Directors of wheat collection centers in Cliza, Totora, Redención Pampa, Yamparaez, and Tarija. Campesino staff interviewed a total of 20 farmer-users who had all sold wheat to the WMD. Lists of officials and users interviewed are presented in Annexes A and B.

1. General Description of the Project

The purpose of the project is to supply small farm grain producers with production and marketing incentives for their wheat. The intended benefits offered by the project include (1) the construction of silos conveniently located near wheat production areas; (2) where possible, on-farm pick-up and transport of produce which spares farmers high transportation costs; (3) remunerative prices for wheat delivered, with incentives for high quality, well-cleaned produce; (4) a steady and reliable market for all marketed surpluses wheat growers care to sell; (5) honest weighing of produce; (6) cash payments on delivery; and (7) the opportunity to sell directly rather than through intermediaries. In the context of nation-wide benefits, the project seeks to promote large increases in the domestic production of wheat which by alleviating imports of foreign wheat would save Bolivia valuable foreign exchange.

As a rule, the campesino brings his wheat to the established centers. These consist of batteries of four silos with 1,200 metric tons aggregate capacity, office facilities, a warehouse, cleaning equipment, scales, and one or more vehicles. In two of six instances, however, the centers send a vehicle to the producing areas for farm-gate wheat purchases. The wheat delivered is weighed and evaluated for quality. Quality is determined by classifying the wheat (criollo or jaral varieties), and by determining moisture content and the foreign matter present. Price is then fixed according to a schedule. The WMD fills out several forms, gives copies of these to the seller, and pays cash (or by check) on the spot.

The wheat is then loaded into a silo. Sometime later it is unloaded, transported to a Bolivian private mill and sold. After milling, which is usually after at least 30 days, the miller pays the WMD. The process is accompanied by a plethora of forms, vouchers, financial records, and operating reports which swell administrative paperwork and which are duly passed on to departmental and national offices of the Ministry of Industry. Collection center employees are supposed to reside at the centers, especially during the peak buying seasons.

ACHIEVEMENTS TO DATE: As shown in Table III-A, the WMD was able to attract a large increase in wheat marketings between 1980 and 1981, though 1979 levels were not reached. The Division projects an unreasonably optimistic fourfold increase in wheat collections for 1982, but this will depend on the completion of two new centers as well as improvements in operating procedures. The six centers in existence as of 1979 have all received PL480 financing, and four additional Title III-assisted centers are under construction.

TABLE III-A: WHEAT PURCHASES AT W.M.D. CENTERS (1979-1982)

<u>Name of Center</u>	1 9 7 9	1 9 8 0	1 9 8 1	1 9 8 2
	metric	tons	tons	(goals)
Yamparaez	746	133	347	920
Tomina	514	132	208	690
Redención Pampa	644	56	322	1150
Totora	285	21	290	690
Cliza	304	-	215	460
Betanzos			90	460
Lourdes		507	320	460
Cotoca				3000
TOTALS	2493	849	1792	8290

Source: PL480 Executive Secretariat

During 1981 WMD raised its wheat prices by 40 percent, and this allowed the wheat collection centers to significantly improve their volume of purchases. However, since operating capital for wheat purchases was not expanded accordingly, purchase volume increases had to be accomplished by skillful--and occasionally clandestine--transfers of funds between centers. Two centers were able to buy 5.5 million pesos worth of wheat (US\$220,000) with 3.0 million pesos (US\$120,000) transferred back and forth between themselves. A final achievement of the centers is that they tend to generate significant seasonal employment during the buying periods.

FUNDING TO DATE: The Sixth Amendment to the Program Agreement dated May 19, 1980 assigns US\$3.5 million to the Wheat Collection Centers Project. As of December 31, 1981 US\$1.965 million had been disbursed. For 1982 the Agreement programs US\$1.5 million, while the Division has requested US\$1.8 million.

Title III funds have been used to construct center office-residences and warehouses, to purchase six 12-ton trucks, and for the construction of four new 1200 MT centers. For 1982 funds are requested to complete construction at Abapó, Cotoca, Villa Talavera, and Junacas, to purchase grading and control equipment, to purchase eleven 1.5-ton pickups, and to pay salaries at the new collection centers.

2. Findings at the Institutional Level

In general, when the wheat collection centers have functioned, they fulfilled most of the objectives cited under the project purpose. An honest, secure market at a steady price was created. The centers have purchased almost exclusively from small farmers, and the reaction from intermediaries has been ugly in some areas. Finally, near some centers wheat production appears to have been stimulated.

However, at the same time institutional problems have been overwhelming. Most of the underlying problems of deficient technical design and operation were noted in a recent evaluation report completed by wheat specialists from Kansas State University (see section J-2 of this chapter). Deficiencies cited by KSU have been exacerbated by a lack of vehicles, quality analysis equipment, office equipment, spare parts for equipment repair, furniture for resident personnel, and scarcity of staff. Several centers have neither electricity nor running water, rendering grain handling equipment non-operational. Most centers do not purchase grain throughout the year. Since small farmers often prefer to sell their wheat little by little over the course of several months or even the entire year, the collection centers are closed when many users wish to sell; this forces producers back into the hands of extremely resentful traditional intermediaries. There is a 12-ton truck at each center, but these are too large (and uneconomical) for field promotion, trips to town, and even access to some user villages. Employees must travel unescorted to and from the mills carrying hundreds of thousands of pesos in cash, thus exposing themselves to great personal risk as well as the temptation to borrow from operating funds for personal use. Salaries are absurdly low: 5-6000 pesos per month (US\$200-240) for persons administering as much as three million pesos in cash operating capital. This caused the resignation of two center directors in 1981, and the WMD has been unable to replace them.

Excessive centralization of accounting and administrative control in La Paz, and the refusal of MICT to release budget to the project, are problems which have resulted in project delays and malfunctions too numerous to mention. These include resignations of key personnel, user reports of non-payments at delivery, the evaporation of per-diem payments, capricious discounts for foreign matter and moisture content (for lack of measuring equipment), failure to authorize purchases until most of the harvest was completed (in 1980), failure to authorize

the purchase of high quality Mexican wheat varieties (at Cliza in 1982), and declining real purchasing power of the rotating fund.

In the face of these problems, the KSU evaluation of October 1981 stated: " The WMD suffers from four basic weaknesses which impede it from carrying out its functions in an efficient and successful manner. These weaknesses are (1) the position of WMD within MICT, (2) funding, (3) financial controls, and (4) personnel. The lack of funding by the GOB has forced the WMD to operate at unsuitably low levels and to resort to the generation and use of its own "revenues"...It is obvious that the current financial and managerial controls are not adequate." (KSU Report, pp.70-71). The Executive Secretariat has suspended further Title III funding for new center construction pending MICT response to the KSU recommendations.

3. Findings at the User Level

During those days and months when the wheat collection centers are open for business, small farmers are generally quite favorably disposed toward the project. Sellers queue until late at night to sell wheat at the centers. They request that the project be expanded and that additional services be added to it. Requested additional services include the more frequent sending of trucks to the communities of supply for farm-gate purchase, the acceptance of all wheat varieties meeting minimum quality standards, the addition of purchasing clerks to the centers during peak buying seasons (to shorten waiting time), and the addition of agronomic technical assistance, production credit, and input supply services to ongoing center operations. An especially frequent request was that the centers remain open purchasing wheat throughout the year. In short, users like the project when it functions. Indications are that wheat production may have been stimulated in the vicinities of the most effectively functioning centers.

User opinion toward the centers turns strongly negative when the project malfunctions. Users expressed keen resentment against the practice of capricious discounts that had not been explained to them, of wasting trips to closed centers or waiting in vain for them to open on announced buying days, of having to sell once again to angry intermediaries who have repeatedly threatened them with violence, and of being forced to sell to the center (Yamparaez) because of a roadblock erected to interdict wheat shipments to millers directly.

With specific reference to user answers to interview questions, the following results are indicative: (1) Of 14 responses, the average amount of wheat sold to the WMD was 19 quintals (1900 pounds or 0.86 metric tons). (2) Eight transported their wheat to the center by mule (reflecting locational proximity to production zones), five brought it in privately-owned trucks, and one lived nextdoor to the center. WMD transportation had not been used by any of these respondents. (3)

Of ten respondents, eight felt that WMD paid the highest prices, one felt the free market price was highest, and one saw no difference between them. (4) Of 14 responses, one preferred to sell wheat during April-May, four during June-July, five during August-September, one during November-December, and three whenever they felt a need to sell. (5) Of 20 responses, 17 replied that it was advantageous for them to sell to WMD while 3 said it was not. Advantages of selling to WMD included a higher or fair price (13 responses), rapid cash payment (6 responses), courteous treatment by the buyers (3 responses), and a secure market (3 responses).

Users feel that the fixed WMD price is generally competitive, particularly during peak sales seasons, when the centers apparently establish a floor under the market. For example: "Prices are better with MICT because they remain fixed", says one Cliza user, "but the intermediaries raise and lower their prices constantly." Or in another instance. "Prices are better at MICT because they pay according to quality."

When a center suspends purchasing, either for lack of buying capital or because the peak sales season has ended, wheat growers must again resort to intermediary buyers. In a number of reported instances these buyers have reacted in an ugly manner. For example, "We need MICT to buy more permanently, if possible all year, because without MICT the rescatistas insult us, offer bad deals, and cheat the campesinos very much." (Cliza user). "When MICT isn't buying (the intermediaries) offer us whatever price they feel like, and they tell us 'Now that (MICT) is your buyer, go sell to them!" (Cliza user).

A particularly negative opinion of the project was encountered at Yamparaez, where the center evidently caused the traffic police to set up a roadblock to embargo the free passage of wheat shipments to millers in Sucre, who were reportedly paying 80 pesos more per quintal. Two users were additionally embittered by an incident in which their animals had strayed into the fenced compound of the Yamparaez center and had been beaten to death by WMD employees: "MICT doesn't benefit us, instead we give them benefits. The deal was that they would buy from us at a higher price, and for that reason we gave them the land (for the center), but now the employees there have caused us a great evil. When one of our animals gets through their fence, they kill it with clubs."

Twenty respondents answered the question: Did you have marketing problems? Of these, 12 answered yes while 8 said no. All marketing problems cited were the result of center mismanagement: Excessive quality or impurity discounts (3 responses), lack of purchasing capital at the center (2 responses), the need to wait several days for payment (2 responses), suspension of purchasing during months farmers needed to sell (2 responses), and the absence of resident center staff during announced service hours (2 responses).

4. Recommendations

A total of 37 recommendations were made by project users. Of these, 19 requested an expansion of wheat collection center services. Six users requested that the centers sell them farm supplies on credit with loans to be repaid by sale to WMD of the resulting harvest. Seven wanted WMD to send trucks to their communities for farm-gate wheat collections, and requested that these visits be more continuous throughout the year. Four wanted technical assistance in wheat production. Two suggested the centers offer tractor services.

Eleven users requested that wheat prices be raised. Five requested the correction of deficient administrative practices--particulary the reduction of impurity discounts, keeping enough cash on hand to meet normal sales demand, and extension of the centers buying seasons. Two farmers urgently requested the cooperation of the evaluators in assisting Yamparaez wheat growers to remove the roadblock preventing them from selling their grain to Sucre on the free market.

From the foregoing user commentaries it is apparent that despite inept project administration, the wheat collection centers have functioned to provide tangible benefits to perhaps several thousand small farmers in Bolivia. Assuming average wheat sales of 19 quintals or 0.86 metric tons, and taking the figures of wheat tonnage collected reported in Table III-A, it can be estimated that some 2,900 growers were served in 1979, just under 1,000 in 1980, and about 2,100 in 1981. Yet, the evaluators ask, at what cost? The total volume of wheat handled since PL480 financing began totals 5,134 metric tons versus project expenditures by Title III alone of US\$1.965 million, i.e., US\$382 per ton handled--a figure totally disproportionate to the volume of benefits generated. Furthermore, WMD cannot administer nor MICT finance its current volume of operations. How will the Ministry handle an even larger project? And while farmers have benefited, they have also suffered at the hands of the project. They have received ill-treatment from intermediaries when centers quit operating, suffered arbitrary price discounts, lost many hours or days waiting for center employees, had their access to free market buyers roadblocked, and even lost livestock.

RECOMMENDATION: For the above reasons it is recommended, first of all, that Title III terminate further assistance to the WMD and MICT, and that all further support to this type of project be frozen until its more efficient implementation can be guaranteed.

RECOMMENDATION: The Secretariat is urged to initiate three-way discussions between itself, MICT, and the Departmental Development Corporations for the purpose of negotiating a transfer of the assets and management responsibility of the existing wheat collection centers to the care of the respective DDCs of each department where centers are located.

Each DDC would be invited to complete a study of the needs of its respective centers, suggest a region-specific strategy for overcoming present center deficiencies, if possible, and what mix of external and DDC counterpart funding would be required to place the centers on an eventually self-sustaining basis. Proposals to this effect would be submitted to the Executive Secretariat which, pending a restoration of Program support by Washington, would finance acceptable proposals out of fund balances of the Wheat Collection Center Project as specified in the Program Agreement.

RECOMMENDATION: In the technical opinion of the evaluators, the existing centers simply can not be operated on an economic basis as infrastructure exclusively devoted to wheat purchasing. Only a fraction of existing storage capacity is being used at present. It is recommended that in any reformulation of the project at the regional level, consideration be given to making the silos collection centers for other basic grains grown by small farmers, particularly corn. Furthermore, in the interest of providing users with a truly useful level of service and volume of benefits, it is suggested the collection centers be redesigned as farm service centers capable of offering agricultural extension supervision, farm supplies, and possibly equipment rental services to current and future campesino users. While elements of this strategy would undoubtedly profit from close coordination with BAB and MACA, we believe it is essential that management responsibility be maintained by the DDCs.

B. DEVELOPMENT OF INTEGRAL COOPERATIVES

The National Federation of Savings and Loans Cooperatives (FENACRE) receives Title III funds to provide technical and administrative support for three integral cooperatives which serve a collective small farm membership of about 2,500 producers. Within FENACRE, the National Office for Integral Cooperatives (ONCICOOP) was created as a semi-autonomous agency for helping the cooperatives become financially and administratively self-sufficient. The PL480 Program finances the services provided by FENACRE, the operating costs of ONCICOOP, and a portion of the operating costs of the three participating integral cooperatives.

This project was not subjected to in-depth review by the evaluators because of the recent completion of an extensive evaluation of the integral cooperatives and FENACRE/ONCICOOP technical assistance by external consultants of the firm DEVRES, Inc. The DEVRES study team reviewed project records, visited cooperatives, interviewed their staff and membership, and produced a voluminous document containing many recommendations.* However, institutional interviews were conducted with FENACRE and ONCICOOP staff at the Federation's national headquarters in Cochabamba. Furthermore, brief encounters with management personnel of two integral cooperatives were made by Bolivian staff in Cochabamba and Santa Cruz in the course of impact evaluation activities connected with other projects.

1. General Description of the Project

The IC Project is part of a larger ongoing USAID program entitled Small Farmer Organizations which began in 1975 and was implemented through the National Community Development Service, a MACA agency. This program was intended to increase family income and improve the living standards of rural people via the establishment of an independent agricultural cooperative movement based on larger, regional-level integral cooperatives serving clusters of smaller groups of farmer-members. The purpose of the integral cooperative was to supply centralized management for a range of services needed by farmers: credit, input supplies, mechanization, marketing, agroindustrial processing, etc.

* David F. Eding and Keith L. Oberg, "Final Evaluation of the Bolivia Small Farmer Organizations I Project", DEVRES Inc., USAID Contract AID/SOD/PDC-C-0223--Work Order No.12, April 17, 1981.

At the time of the original Program Agreement, a total of US\$4.5 million was set aside for the Integral Cooperative Project, which then contemplated the eventual establishment of 20 regional co-ops and a cooperative federation--all under the aegis of the NCDS. But when this agency demonstrated complete inertia in developing a project proposal with the Secretariat could approve, FENACRE was chosen to be the implementing agency. It entered the picture under considerably difficult circumstances, for the co-ops were unraveling due to internal conflicts, threatened insolvency, and squabbles with expatriate advisors. Quite frankly, FENACRE's was a "rescue" mission. Upon the inception of its activities in January 1980 there were four integral co-ops. One of these was suspended from the project three months later because of its refusal to repay a substantial debt to the Bolivian Agricultural Bank. The effort to establish new ICs was suspended pending the successful consolidation of the surviving three. The organization of an IC federation was likewise postponed as premature.

ACHIEVEMENTS TO DATE: A new administrative and technical assistance structure was installed by FENACRE to improve co-op efficiency. Accounting systems for both ONCICOOP and individual integral co-ops were established, complete with their respective manuals. ONCICOOP carried out a series of education activities including agricultural techniques for extension agents, seminars for co-op directors, and intensified management training for co-op staff.

The surviving integral co-ops have apparently stabilized and all three report increasing memberships--2,000 in Cochabamba, 650 in Santa Cruz, 300 in Gran Chaco. ONCICOOP maintains it has been instrumental in diversifying member production and rationalizing input use. Increased assistance to members in marketing their production is taking place.

FUNDING TO DATE: This project has received US\$723,854 of Title III funds to date, which represents only 51 percent of the budget assigned in the revised Program Agreement. About US\$440,000 has been tentatively programmed for the 1982-1984 period.

2. Findings at the Institutional Level

While making some progress in providing financial and technical assistance to the cooperatives, the project has fallen short of its objectives. A significant range of project deficiencies are documented in the DEVRES evaluation, the PL480 Program's 1981 Annual Report, and in the August 1981 Annual Report of ONCICOOP/FENACRE. These include: (1) bureaucratic and political difficulties stemming from the diverse interests of, and evidently poor communications between, USAID, the Secretariat, the Bolivian Agricultural Bank, and FENACRE; (2) a poorly-functioning participatory structure within the cooperatives--evidenced by continuing conflict between paid managers, directors, and the members-at-large;

(3) lack of substantial progress toward self-sufficiency of the co-ops, in part the result of very low levels of member share capital investment relative to external capital borrowing; (4) lack of qualified people to manage the co-ops, combined with inadequate mechanisms for ensuring direct accountability of managers to the membership; (5) generally inadequate levels of membership education, which results in their imperfect understanding of co-op functions and lack of confidence in its operations; (6) virtually unsolvable problems regarding the supply of machinery services to members in a cost-effective fashion; (7) conflicts with PL480 and DCCP regarding incompatibility of co-op accounting systems and financial reporting requirements; and (8) poorly planned and implemented production credit activities for members, in part based on inadequate farm-level data.

3. Findings at the User Level

No impact evaluation at the user level was conducted. However, the impressions contributed by several Bolivian staff already acquainted somewhat with integral co-op operations through contacts with friends or relatives who are members suggest the broad conclusion that the project belongs more to technicians than to campesinos. From its inception the IC Project has been characterized by highly centralized, top-down, technocratic, and fairly paternalistic approaches to cooperative promotion among the rural poor. The opinion of various evaluators coincides in that this is a project very inadequately in touch with the population it seeks to help.

4. Recommendations

RECOMMENDATION: The evaluation finds that the Integral Cooperatives Project is one of several PL480-financed undertakings "inherited" from the years before the Program Agreement was signed, and neither the Secretariat nor FENACRE can really be held accountable for the undertaking's lack of success. Both institutions, in effect, were asked to save a perhaps terminally sick patient, and it is not clear that additional injections of funding for technical assistance and management subsidies to cooperatives will accomplish the miracle cure everybody would like to see. On the other hand, additional funding requirements are relatively modest and FENACRE claims the project's vital signs are beginning to rebound. It is therefore recommended that the Secretariat continue funding to this project at Agreement levels through 1982 to allow the recommendations of the DEVRES evaluation to be implemented by FENACRE. At this stage, however, the present-year FENACRE objective of reviewing the situation of ten additional co-ops, and incorporating at least three into the project, is highly premature and should be discouraged by the Secretariat. Clearly, no project expansion is advisable until the first three integral cooperatives have been stabilized and their self-sufficiency demonstrated.

C. COLONIZATION ROADS

Title III has financed the improvement of the Chané--Rio Piraí colonization road in the Department of Santa Cruz--originally conceived in the Program Agreement as the first of an ambitious two-stage communications infrastructure project budgeted at US\$7.5 million. This is another of the Secretariat's "inherited" projects over which the Program had no significant participation in its design nor in the choice of the contractor. The executing agency is the National Colonization Institute (INC), which selected the road contractor DEV CALABI Construction Company. Because of the insolvency of the contractor in early 1980 the project has been frozen for practically two years. For this reason the evaluators only interviewed Executive Secretariat staff about the Chané--Rio Piraí project.

1. General Description of the Project

The Colonization Roads Project contemplates two distinct infrastructure investments. The first was the widening (from 4 to 8 meters) and graveling of the Chané--Pirai road, a 60 kilometer stretch, along with the construction of associated ancillary civil works (drains, culverts)--an undertaking budgeted at US\$1.5 million. The second was the construction of the San Julian Norte road to link San Julian and Casarabe. Both activities are designed to support other USAID investments in this colonization region. They were placed as a shelf project in the Title III portfolio because of the speed and ease of PL480 project financing procedures.

In early 1980 DEV CALABI declared bankruptcy and abandoned its INC contract. After a series of meetings among concerned institutions (INC, CORDECRAZ, USAID, National Roads Service, and the PL480 Secretariat), the decision was taken to rescind DEV CALABI's contract. In Bolivia contract revocation is a lengthy and complicated process under the best of circumstances, but inertia by the INC prolonged it even longer. After almost two years the process is only recently completed, and the Secretariat will now contract directly with the INC, which intends to undertake the construction. Title III will contract one civil engineer with a specialization in bridge construction (to oversee the building of a bridge over the Rio Chané) and one transportation engineer experienced in road construction. Both engineers will be contracted from the National Roads Service (SNC) and will provide full-time, on-site direction and supervision to construction activities.

ACHIEVEMENTS TO DATE AND 1982 GOALS: Before abandoning the project, DEV CALABI widened 60 and graveled 20 kilometers of road, and installed an as yet undetermined quantity of culverts, drains, and other civil works. The construction has deteriorated seriously over time, first because heavy logging truck traffic--ignoring feeble roadblocks--have used the unfinished roadbed continuously during the rainy season, rutting it badly. What the loggers could not destroy the elements are rapidly finishing-off. Thus, resumption and completion of the project will be expensive, and the entire road will only be terminated at a cost greatly in excess of the original budget.

FUNDING TO DATE: Of the US\$1.5 million budgeted for the Chané-Pirai road under the Program Agreement, US\$1.072 million (71 percent) was disbursed prior to DEV CALABI's bankruptcy. Future contemplated construction is budgeted as follows: (1) Rio Chané bridge--US\$1.5 million, and (2) Chané-Pirai road completion--US\$2.0 million. The preliminary estimate for the construction of the San Julian Norte road has been whittled down to an austere US\$2.4 million. Obviously, these investments can only be contemplated in the event of a renewal of Program funding support by Washington.

2. Findings at the Institutional Level

This is perhaps the appropriate place to mention the development significance of the colonization roads project. CORDECRAZ, USAID, and the OAS are all presently assisting the National Colonization Institute in the development of the Chané-Pirai settlement area. CORDECRAZ has concluded negotiations with the World Bank for a US\$14 million integrated rural development project in the Chané zone, and final Bank approval for the project is contingent upon the completion of the Chané bridge and the Chané-Pirai road.

Since 1980 and the CALABI bankruptcy, the Secretariat has worked diligently to clear obstacles from the road project's path. It pushed the INC to complete contract revision proceedings, and it completed a comprehensive reprogramming of project construction strategy and 1982 budgeting for renewal of road-building activities even though, in a narrow sense, these were the responsibilities of the INC. It is expected that programmed expenditures will fulfill World Bank conditions-precedent for the Chané-Pirai IRDP.

3. Recommendations

The aforementioned efforts were all well and good when the Secretariat was sitting on a resource reserve of US\$17.3 million in local currency. Now that that reserve has been slashed--by depreciation losses--to a mere US\$7.3 million, which is all that remains to sustain all Program operations through 1982, it is necessary to view the colonization roads

project in a different light. Painful though it might be to contemplate risking the loss of imminent World Bank financing for the Chané-Piraí area, it is the considered opinion of the evaluators that the colonization roads project be categorized as second-priority, and no further funding be authorized until late 1982 at the earliest, and only if a renewal of Program support has been approved by Washington at a level in excess of US\$30 million for the remaining two years of the Program.

RECOMMENDATION: Given a renewal of Program funding, it is recommended that only funding be authorized for the first stage of the colonization roads project, i.e., the completion of the Chané-Piraí road and the Río Chané bridge. Considering the difficulties already encountered with the first stage, we do not consider it prudent to spread Secretariat engineering oversight over two complicated projects at the same time. The San Julian Norte road should only be initiated after the Chané-Piraí infrastructure has been finished.

D. AGRICULTURAL SERVICE CENTERS

As originally conceived in the Program Agreement, this project contemplated the construction of some 90 farm service outreach facilities which would provide both headquarters and staff lodging for clusters of GOB agencies serving the agricultural sector. A total of US\$7.0 million was originally budgeted for this scheme. Its management was entrusted to MACA.

To date not a single center has been constructed. Virtually all progress on this project has been restricted to the development of prototype blueprints for centers in different ecological regions, and negotiations with municipalities throughout the country to obtain donations of land on which to construct the centers. Also, bidding has been completed and the construction contracts signed for the first four service centers. These gains may appear ludicrously modest when compared to the project's original target and budget, but they become understandable when one considers the fact that progress to date has been almost entirely due to the efforts of the Executive Secretariat. In over three years the Ministry of Agriculture has hardly bothered itself to support the undertaking.

Since the only tangible results of the project are still in the blueprint stage, the evaluation did not bother to conduct an in-depth review of its characteristics. Regarding the service centers, the only interview was conducted with the Executive Secretary himself.

ACHIEVEMENTS TO DATE: The Secretariat completed a comprehensive survey of MACA dependencies and decentralized agencies to determine how many and which kinds of institutions--and where--should be considered as candidates for office and housing accommodations in the future service centers. Next, to further push the project along the Secretariat hired architects, drafters, and a civil engineer to design prototype blueprints for the centers; 18 plans have been completed. Of these, construction bids on four (two in Santa Cruz, one in Chuquisaca, and one in Potosí) were awarded in June-July 1981. However, their construction has not yet begun, and with the recent February 1982 devaluation of the Bolivian peso it is inevitable that the contracts will all have to be renegotiated or a new round of bids conducted.

FUNDING TO DATE: Of the original US\$7.0 million budgeted for this project, US\$146,071 has been spent. To bring the four presently-bid centers to completion, about US\$400,000 will be required.

RECOMMENDATION: Given the funding constraints facing the PL480 Program, the evaluators find the service centers concept to be a luxury which Bolivia cannot afford. Moreover, in the absence of a defined strategy for reorganization and decentralization of MACA and its many agencies, the construction of service centers is decidedly premature. Finally, given MACA's almost complete inertia in supporting this project during the last three years, that Ministry does not deserve the project nor is it capable of managing project implementation. For the above reasons the evaluation finds the Service Center Project to be not even a second-priority but rather a third-priority project. If at all possible, we recommend that PL480 funding to this project be discontinued immediately--before awarded bids are renegotiated. At the very most, we recommend assignment of no more than US\$500,000 to finance the completion of the first four centers bid, but under no circumstances request bids for construction of additional centers until the first four have been completed and their utility and performance evaluated. In short, the Service Centers Project must be suspended as quickly as possible and further expenditures contained to the absolute minimum necessary to honor any pending contractual commitments, if any.

E. PESTICIDE CONTROL AND PLANT QUARANTINE

Title III funds are being used to support a major expansion of activity by MACA in the field of pesticide control and plant quarantine programs. Chiefly, the effort is designed to provide more effective and uniform enforcement of the 1972 Phytosanitary (Plant Health) Law, D.S. 10283. Administration of the law is charged to the Division of Sanidad Vegetal (SV), which receives the Title III monies. During the evaluation, institutional interviews were conducted in La Paz with the National Direc-

tors of the Plant Health and Pesticide Departments at MACA headquarters, and with SV staff in Cochabamba. The focus and benefits of the SV project incide at societal levels; it would be difficult to identify small farm "beneficiaries" or users of project services. Hence, no user interviews were conducted for this project.

1. General Description of the Project

According to the PL480 Program's 1981 Annual Report, the general objectives of the Pesticide Control and Plant Quarantine Project are (1) to provide guidance to the small farmer on the use and handling of pesticides, and (2) to prevent the introduction of diseases and plagues carried by imported plants or plant products.

In practice, Sanidad Vegetal engages in three major activities, all importantly supported by PL480 funding. These are: (1) the enforcement of plant quarantine and border vigilance over vegetable material entering the country; (2) the combating of periodic disease and pest outbreaks such as coffee rust, spider mites, stalk borers, fruit flies, citrus canker, etc. (For example, in 1981 some 55 percent of SV's total staff was engaged in combating coffee rust.); and (3) the control of pesticide quality and the provision of technical assistance to sellers and users in the appropriate, legal, and most efficacious use of pesticides. The reader is referred to the 1981 Annual Report of the PL480 Program for detailed specification of activities conducted under the above headings.

PL480 funds have been used to contract 20 new SV personnel, including 17 technical staff; to construct and partially equip a pesticides analysis laboratory in La Paz; to construct and equip plant quarantine border posts; to purchase vehicles; to train professional SV administrators and technicians; and to subsidize miscellaneous Division operating costs.

GOALS FOR 1982 AND BEYOND: Immediate project goals include the acquisition of remaining pesticide analysis laboratory equipment (work benches, bookcases, lab samples, etc.), the acquisition of three additional vehicles, the construction of a regional plant quarantine station mandated for Bolivia by the Cartagena Agreement, and tightened enforcement of D.S. 10283 at border posts and retail pesticide sales outlets. At the small farmer level, the project seeks to initiate demonstrations, field days, and farmer training courses, to establish demonstration plots, to conduct pesticide trials, and to conduct expanded phytosanitary campaigns against seven pest problems which seriously threaten small farm agriculture in Bolivia. Of course, the Division's ability to meet these goals will largely depend not on PL480 funds but on adequate levels of increased counterpart budget commitments provided by the National Treasury.

FUNDING TO DATE: From 1979 thru 1981 the PL480 Program disbursed a total of US\$831,000 to the Plant Health Project. Over this same period, GOB counterpart disbursements amounted to only US\$88,000 to support the operations of SV's Plant Health and Pesticide Departments. For 1982, SV has requested US\$294,000 in Title III funds while the GOB has approved but not yet disbursed US\$204,000.

2. Findings at the Institutional Level

Plant health and pesticide control activities are of obvious social benefit to Bolivia. Title III has permitted the expansion of the SV program as well as the more strict enforcement of Bolivia's Plant Health Law, an excellent piece of legislation which, until recently, was widely ignored. Eight new plant quarantine stations, staffed by qualified professionals, have been established or enlarged since 1979. Control of pest outbreaks has been swifter and more constant. Perhaps most importantly, the Pesticide Division has been able to take a much more active role in regulating pesticide use by promoting correct use of agro-chemicals, monitoring and denouncing product adulteration, maintaining label integrity, and enforcing the sale of products in their original containers. The need for these services is evident from a study of cotton workers published by the SV in 1981. Of 237 cotton workers examined, 147 were pesticide-intoxicated, or 62 percent!

The SV has a long-term objective of training 10,000 campesinos to deal with on-farm pest control problems. The Division feels its limited and highly-trained technical staff should primarily focus its energies on enforcing compliance with the pesticide law, operating the quarantine system, and providing technical backstopping and supervision to the proposed cadre of trained campesinos. The evaluation team agrees with this strategy. SV personnel are too few to operate as a specialized extension service, and campesinos can certainly learn to control field pest problems when technical back-stopping is made available to them.

PROBLEMS: Under the Agreement, MACA is obligated to "strengthen the national plant quarantine and sanitation program". The GOB's share of total SV project costs was to be zero in 1979 and 1980, 13 percent in 1981, 39 percent in 1982, and 70 percent in 1983. While the GOB has so far exceeded this schedule, it still has contributed just 10 percent of the SV budget since the project began. Of 56 total professional staff in the Division, just 8 are regular MACA permanent-hire positions. Of the rest, 17 are PL480-funded, and 31 work in the coffee rust campaign under a special Treasury line of funding.

In 1981, SV requested from the GOB budget support of 24.0 million pesos. They received approval to spend 8.0 million, and were actually disbursed only 6.0 million pesos--a mere 25 percent of their original request. Before the 1982 devaluation, SV applied for 49.0 million pesos in bud-

get for this year and were approved only 9.0 million. Disbursals have not yet begun, but given the present economic crisis there is no reason to expect compliance with even this bare-bones, already-obsolete authorization. The evaluators received reports of the non-payment of per-diems, the curtailment of other office support, severe restrictions on vehicle use and gasoline consumption, and imminent reductions in staff.

In sharp contrast to these forced economies, and a budget authorization valued at no more than US\$204,545 (at the new exchange rate), the SV estimates annual pest losses in Bolivia from all causes at a whopping US\$250 million per year.

3. Recommendations

It is recommended that Title III continue funding to Sanidad Vegetal as per the Program Agreement. However, the Secretariat is urged to apply budgetary pressure opportunely if MACA fails to comply with its obligations to adsorb all of the expanded SV functions into its normal operating budget, or fails to fund the two SV Divisions at least at the levels called for in the Project Agreement, i.e., US\$165,000 in 1982, and US\$240,000 in 1983 and beyond.

RECOMMENDATION: The SV objective of large-scale training of campesinos in on-farm pest management is appropriate and deserves PL480 endorsement and financial support. However, we question the efficacy of a once-only mass training effort directed at 10,000 farmers. Instead, we would endorse the recruitment of a much smaller contingent of part-time farmer-paratechnicians, perhaps 100 of them, selected to assist with farm-level promotion of pesticide control and sanitary campaigns. Once initially trained, this cadre would require a 1-week per year in-service training to constantly up-date their skills in accordance with the growth of new products and pest management technology. These paratechnicians would also require logistical backstopping such as back-sprayers, rubber boots and gloves, field trial guidelines, and a basic stock of agrochemical products with which to conduct their promotion activities. If each paratechnician were to realize an average service coverage reaching 100 other campesinos, the spread-effect and benefits offered by this scheme would, in our opinion, far exceed the 10,000 farmers targeted by SV in its original formulation of farmer training activities, and at exceedingly less cost.

RECOMMENDATION: It is noted that 31 of 56 SV technical staff (55 percent) are working in the coffee rust control campaign. The controlling of this disease through spraying is of questionable efficacy under field conditions of high rainfall such as those in the Alto Beni, Nor- and Sud Yungas. Therefore, it is suggested that this distribution of manpower and budget within the SV be evaluated with a view to reprogramming some of these resources to pesticide fiscalization and farmer training activities.

F. FORESTATION PROJECTS

Title III funds support forestation activities in the departments of La Paz, Cochabamba, Tarija, and Potosi. Projects are administered by both Government and semi-private sector agencies. These are (1) the Corporación Forestal (CF), a MACA dependency; (2) the Proyecto de Conservación y Rehabilitación de Tierras de Tarija (PERTT), an autonomous agency funded by the Treasury, PL480, CODETAR, and from time to time one or more foreign donors; and (3) forestation sub-projects of the Departmental Development Corporations of Cochabamba (CORDECO), and Potosí (CORDEPO). Each administering agency works within one department only.

During the evaluation, institutional interviews were conducted with the CF in La Paz, at CORDECO in Cochabamba, and at PERTT in Tarija. The institutional-level evaluators visited the central nursery of Huancané (CF/La Paz), another at Millu Mayu (CORDECO/Cochabamba), and two PERTT central nurseries located within the Municipality of Tarija. Additionally, PERTT community-level nurseries were visited at Coimata and Erquis Norte, while rural forestation sites were visited near Millu Mayu, Coimata, and Erquis Norte and Sud. Tree transplanting was underway at two of the sites during these visits.

Campesino staff conducted interviews with some 33 project users in 15 communities. Lists of officials, agencies, communities, and users contacted or interviewed are presented in Annex A and B.

1. General Description of Forestation Projects

PURPOSE AND OBJECTIVES: The PL480 Annual Report for 1981 describes the purpose of the forestation projects to be the conservation and preservation of eroded soils, the incorporation of unproductive land into economic use, the supply of wood and their byproducts to meet Bolivian timber needs, and the generation of additional small farmer income through sales of forestry products. With variations, these same objectives are shared by the four implementing agencies interviewed.

PROJECT ACTIVITIES: Title III funds have been used to support improvements in nurseries--such as the construction of water supply systems, offices, permanent nursery beds--and to purchase tools, equipment, or vehicles to support the promotion of forestation activities. Seedlings are distributed from the central nurseries to a variety of campesino groups, who transplant them to both communal and private lands. No

cash wage is paid in transplanting. Instead, this labor is donated by the members of recipient groups in return for the trees and for food provided by the World Food Program (WFP). Trees are made available under a variety of formal contractual arrangements involving credit, repayment, and the distribution of wood sales revenue between the individuals, communities, and implementing agencies involved. A primary intention is to eventually make the implementing agencies self-supporting. The WFP provides to users one food ration per so many trees transplanted. Such rations are an important inducement to the initial promotion of reforestation activities in rural communities and are viewed by users as a significant immediate benefit.

Nearly all tree plantings reviewed by the evaluators were located on hillsides whose only economic use was extensive and marginal grazing, or along riverbanks, gullies, ravines, or field borders where they served as windbreaks or were of obvious use in erosion control.

PROJECT ACHIEVEMENTS AND FUNDING TO DATE: From 1979 thru 1981 PL480 forestation projects have resulted in the planting of 1.3 million seedlings covering 571 hectares in 121 communities. The number of benefitted families is not estimated, but it would reach several thousand since trees are planted on community lands and hence benefit all residents. Without exception, recipients of the seedlings are campesinos who live in or near the communities where trees have been planted. These project users are overwhelmingly concentrated in the poorest segments of the rural community, and the trees are most frequently planted to communal grounds of marginal quality.

As of December 31, 1981 Title III disbursements to the four implementing agencies totaled US\$425,000. Since the first payments were not disbursed until July 1980, the above expenditures represent what has been spent in an 18-month period.

2. Findings at the Institutional Level

The variety of executing agencies in forestation projects has been noted. In general, all agencies have been successful in moving trees to campesinos. However, there are significant differences in the relative performance between these agencies with respect to both numbers of trees moved and cost per tree. These economic performance indicators reflect important differences in delivery methodology and project promotion between the individual agencies.

CORPORACION FORESTAL: The CF, a MACA agency working in Bolivia's Altiplano region, produces seedlings in two large central nurseries. These are distributed to communities and farmer groups with the assistance of the WPF and two additional GOB agencies--the Altiplano Institute for Rural Development (IDRA) and the Altiplano Forestation Research Agency (IFAB). Community promotion--i.e., field work in recipient rural com-

munities--is generally handled by IDRA and IFAB, not the Corporación Forestal. Obviously, the CF depends on the promotional activities of collaborating institutions for project success. According to users interviewed, in practice this promotion has been sporadic and, because it is done by only one individual, is deficient as well. Moreover, the CF has just two sources of budget: Title III and MACA. As in other projects managed by this large and politically unsettled ministry, MACA funding has been inopportune and in amounts far below counterpart commitment levels, resulting in insufficient staff, vehicle support, and related operating expenditure investments. Such deficiencies have seriously compromised project success. As shown in Table III-F, the direct cost of trees produced as well as the number of trees moved compare very unfavorably with CORDECO and PERTT.

CORDECO: The Development Corporation of Cochabamba also produces seedlings in large central nurseries and distributes them to communities and campesino groups. The primary differences between this project and the CF's is that CORDECO has its own operating budget and own independent funds, and uses its own personnel and support services in community promotion and project execution. As a result, CORDECO was able to produce 1.14 million trees at Mullu Mayu during 1981, while the CF nursery at Huancané produced just 99,000.

TABLE III-F: RELATIVE PERFORMANCE OF FORESTATION PROJECTS

Performance Indic.	CORP.FOR. 1980-1	CORDECO 1980-1	PERTT 1980-1	CORDEPO 1980-1	PERTT 1982*	CORDEPO 1982*
Budget (B\$millions)	2.75	1.50	3.49	1.03	0.23	n.a.
Production: (000 seedlings)	99	650	1144	3000	2013 ^b	14.5
Area Covered (hectares)	70 ^c	365	492	1080	935 ^b	9 ^c
Communities benefitting	94	12	21	36	60 ^b	13

* = goal; n.a.= not available

a. The first Title III disbursement to PERTT took place in Dec. 1981.

b. At Sidra nursery 812,500 plus 30,000 in each of 40 Central Valley communal nurseries at a population of 1330 seedlings per hectare.

c. Estimated

Source: PL480 Title III Executive Secretariat

PERTT: This Tarija agency operates three central nurseries. More importantly, however, it has embarked on a new methodological approach which is already the most cost-effective and promises to become the largest mover of trees of any Bolivian forestation agency.

PERTT is now fomenting a series of 60 communal, privately-owned nurseries. Twenty-one of these are now in place, and 19 more are programmed for 1982. These communal nurseries belong to groups of 15-50 individuals and range in size from 20,000 to 55,000 seedlings. They are located in user communities on private grounds. They are cooperatively constructed and cared for by users, with technical and promotional assistance from PERTT. Nursery size is determined by a users poll--i.e., by the total number of trees users say they wish to plant on their farms. When ready, seedlings are transplanted to each member's property. In several instances trees have also gone to communal lands, such as rivercourses or hillside pastures. The nurseries are rudimentary in design, yet have all the necessary facilities (irrigation, fencing, seedbeds, etc.). The cost of establishing each nursery ranges from US\$1,000 to US\$2,000, and the facility can be used twice or more each year. Nursery life expectancy is about five years. Direct costs from these nurseries are estimated to total about 2.5 to 3.8 pesos (US\$0.06-09) per seedling--including all vehicle support costs. This contrasts sharply with seedling costs of CF nurseries, which range from 5 pesos for eucalyptus to 8 pesos for pines.

The Treasury is the primary source of PERTT funding, with additional support from CODETAR and PL480. All promotion, technical assistance, and extension is done directly by PERTT staff and are considered routine agency functions. Meticulous attention is paid to group and nursery organization, nursery management, and transplanting of trees. A series of organizational meetings and written agreements spell out group membership, nursery size, location, management tasks, distribution to recipients, inputs to be provided by PERTT, the lands, tools, materials, and labor to be provided by users, and so on. Technical assistance is continuous, technicians are invariably present at critical junctures in nursery operations such as planting and transplanting, and PERTT holds weekly staff meetings at which the progress of each communal nursery is reported upon.

Both the Corporación Forestal and CORDECO provide users with seedling transplants in bags and in "bare root"--i.e., with no soil adhering to the roots. But PERTT enforces transplanting only from bags with soil protecting the root system. The bare root system is defended on the grounds that seedlings are lighter in weight and can be transported by hand over great distances where there are no roads. However, there is an enormous difference in seedling mortality between the two methods, as will be documented below.

3. Findings at the User Level

In general, users interviewed expressed overwhelming acceptance of the forestation projects at all sites visited. A strong desire to continue and expand these activities was unequivocal. Of the 13 PL480 projects surveyed in this evaluation, forestation enjoyed the most consistent and unanimous user support.

An interesting and almost uniform pattern of user acceptance was found in the ten communities where user interviews occurred. This pattern may be described as follows. Initially there is a certain community resistance to the idea of forestation. Frequently the users are not familiar with silviculture. The idea is new and strange and is not a traditional farming activity. With promotion and technical assistance a number of families are persuaded to try. When the seedling trees arrive, community interest increases rapidly. As the trees are transplanted and begin to grow, the initial pattern of reluctance changes to excitement, and most of the community begins clamoring for more trees. Typically, the final stage in the acceptance process is when delegations from neighboring communities begin to arrive at the implementing agency's offices petitioning for forestry projects of their own.

Seventeen separate uses or benefits from tree planting were cited by user households interviewed. In order of importance, these benefits are categorized thus: (1) roofing and homestead construction materials (13 responses); (2) firewood (9 responses); (3) stakes, posts, mineshaft supports, and agricultural implements (9 responses); (4) control of wind, sheet, and river erosion (8 responses); (5) community betterment (7 responses); (6) windbreaks for crop and homestead protection (6 responses); (7) legacy for future generations (4 responses); and (8) receipt of income from sales or economic use of wastelands. Among the secondary benefits cited were (9) receipt of tools, wire, seeds, fertilizer, insecticides, oxen, technical assistance, or other production inputs as a result of the project (8 responses); or (10) food rations were received for transplanting (4 responses); and (11) a road was opened in support of the project (4 responses).

Nine users were asked if they planned to plant more trees in the future. All of them said yes.

The two main implementation methodologies were equally represented among respondents: eight users had received trees from a central nursery (Huan-cané or Millu Mayu) and transplanted these to communal lands, while eight others had received trees from a communal nursery and transplanted them to private lands. Almost all trees were planted to marginal lands--mostly to non-arable hillsides (5 cases) or to high-erosion locations (7 cases).

PROBLEMS: Users were asked if they had experienced any problems with their forestation projects. Of the 17 responses, the most common reply was that there had been no problems, that the executing agency had lived up to its promises and for this the community was very grateful. Four users replied that the executing agency had supplied all the services it had promised, but not in sufficient quantity. Three users said too few trees had been made available. In two PERTT communities it was reported that disputes over delivered seedlings had broken out between residents. All four types of responses indicate not only very positive campesino perceptions of forestation but collectively describe as well a situation of demand exceeding supply.

In two of four Altiplano communities it was reported that residents feared the project might be a plot by the promoting engineer to steal their land. This is another indication of the relatively deficient project promotion in that region. Either the field agent failed to adequately convey the features of the project to some participating communities or else insufficient contacts had occurred to allow a relationship of trust to be established.

Twelve responses were collected on seedling mortality. Those users who received seedlings transplanted from bags reported mortality estimates ranging from zero to 20 percent, with the normal range from zero to five percent; higher losses were associated with an expectedly severe climatic phenomenon such as frost, or unusual degradations by ants, rats, birds, goats, and other animals. In contrast, users receiving bare root seedlings gave estimates of mortality in the 60-75 percent range.

Thirty-three recommendations were made by users to the question regarding how the project might be improved. Of these, 23 involved suggestions to continue or expand the project in some way, including its extension to neighboring communities. There were 8 suggestions requesting the addition of production credit, input supply, technical assistance, and support for road or irrigation system construction. Two users requested that all seedlings should be delivered in bags, because bare-root transplanting was a waste of time due to its high mortality.

4. Recommendations

All projects visited, regardless of implementing agency, were found to be socially worthwhile and of high, immediate, and obvious benefit to the participating communities and households. The demand for trees at all nurseries was greater than production capacity. Despite this record, and despite overwhelming user acceptance of forestation projects, there were significant methodological differences between agencies which resulted in some projects being far more cost-effective and with far broader coverage than others. Such observations give rise to the following recommendations.

RECOMMENDATION: This evaluation finds forestation to be clearly a first-priority project for PL480 financing, to be maintained without cutbacks even in periods of the most acute resource scarcity. Given a renewal of Program support by Washington, we believe this project could easily absorb US\$1.5 million in expenditures for the period 1982-1985.

RECOMMENDATION: The Executive Secretariat should reappraise the continued funding of PL480 monies to executing agencies that fail to honor their counterpart budget commitments. In the case of forestation, the Corporación Forestal should be made a candidate for the application of such budgetary pressure. It is one thing for the GOB to require an austerity program, but expenditure economies should first be made in those areas of the bureaucracy that do not have projects for which commitments of counterpart funding have been agreed to with foreign donors.

RECOMMENDATION: It is suggested that the Executive Secretariat conduct a more detailed evaluation of the respective methodologies utilized by the different implementing agencies of forestation projects to document which approaches are clearly the most cost-effective. Once the best approach(es) has been identified, the Secretariat should again use budgetary pressure to force a more uniform adoption of implementation strategies that get the best results for the least investment.

RECOMMENDATION: User opinions collected by the evaluation would suggest that bare root seedlings are too risky under Bolivian conditions. If seedling mortality is reaching 60-75 percent levels, as is alleged by users, this practice should be discontinued. The Secretariat may elect to deny budgetary support for this practice, unless a significant number of users request its continuance.

RECOMMENDATION: To meet the rapidly swelling demand for communal nurseries, other forestation activities, and the clamor for follow-on resources and technical assistance, the currently available professional staff of the implementing agencies is insufficient. Instead of adding new professionally-trained staff, we recommend the selection, training, and logistical support of farmer-paratechnicians to help with project promotion and supervision at the community level. It is suggested that the Secretariat urge the various forestation project agencies to submit proposals for training such part- and full-time campesino field agents, and that a modest training and operating support budget for such staff be added to ongoing funding commitments by PL480 to those agencies.

G. SMALL IRRIGATION SYSTEMS

Title III now assists the construction of small scale irrigation projects in the departments of La Paz, Cochabamba, Potosí, Oruro, Chuquisaca, and Tarija. With the exception of the Rio Erquis project in Tarija's central valley, all PL480-funded through the National Community Development Service (SNDC), a MACA agency. The Rio Erquis irrigation is being implemented by CODETAR.

During the evaluation, institutional interviews were conducted at the SNDC's Small Irrigations Office in Cochabamba, the national headquarters for the project. Interviews were also conducted at SNDC regional offices in La Paz and Sucre, and at CODETAR in Tarija. Four irrigation sub-projects were visited (out of the 11 currently being implemented). These were Achaca (La Paz), Tejahuasi (Chuquisaca), Tuti Mayo (Cochabamba), and Rio Erquis (Tarija), where construction was underway during the field visit. Campesino staff interviewed a total of 14 user families in the communities served by these four projects, while informal discussions were held with 11 other users or community residents. Lists of officials, communities, and users contacted are located in Annexes A and B.

1. General Description of Small Scale Irrigation Projects

PURPOSE AND OBJECTIVES: The PL480 Program's 1981 Annual Report states that the micro-irrigation systems are designed to improve the productivity and income of small farmers. According to the executing agencies, these projects are also intended to (1) raise yields and increase agricultural production, (2) raise user income and living standards, (3) extend the area under cultivation, (4) permit more than one crop grown on the same land during the same year, (5) rehabilitate and reclaim eroded lands, (6) promote the cultivation of higher-value crops, (7) permit the use of more intensive production technology--e.g., fertilizers and other inputs, and (8) stimulate and reinforce traditional forms of community organization and self-help.

DESCRIPTION OF ACTIVITIES: Local conditions determine design in each case. Dams, weirs with intakes, and stream diversion structures are all in use. These supply water to primary canals financed under the project, and from there through secondaries and laterals to farmers' fields. All systems visited were gravity flow. Tejahuasi is designed to divert heavily sedimented river water via a canal and to distribute the water behind a retaining wall so as to sediment and reclaim 70 hectares of riverbed.

In all cases the technical design, project execution, and supervision are coordinated by the implementing agency, but with substantial community participation. User contributions include cash (on all SNDC projects), local materials, and thousands of person-days of manual construction la-

bor. Title III and the implementing agencies share costs not paid by the user communities--principally non-local construction materials and specialized labor costs. Once an irrigation system is completed, the community is responsible for system maintenance (through user fees and labor contributions) and water distribution arrangements.

The systems visited were generally simple, yet elegant in design, and took advantage of local features. Costs per irrigated hectare ranged from US\$264 to US\$2,135. Only Tuti Mayo had a cost per hectare in excess of \$900, because a dam was connected with that project.

At Achaca, the river providing water to the system changed course and destroyed about 15 meters of the primary canal, which will have to be rebuilt. This design failure occurred during the project's first operational year. At Tejahuasi, the river flooded and carried downstream approximately 80 meters of the primary retaining wall. It was reported to the evaluators that the supervising SNDC engineer had ignored community advice to deepen the retaining wall's foundations. A similar retaining wall directly across from the project site has also been destroyed by the river, and the remnants of that wall are still visable.

At the systems visited, individual and comunal water rights and allocations are based on traditional, and often ancient, community norms. Typically, user families contribute cash and labor to project construction and maintenance in quantities governed by the amount of land they intend to irrigate and the number of hours per day they need to receive water. The systems are administered at the community level by water committees, while disputes and rights are adjudicated by water judges. All offices are elective, elections are held annually, and all office-holders are project users. The system is a traditional one, and has evolved through the centuries in association with small, indigenous irrigation networks which in some instances are many centuries old. Thus, the participation of the executing agency is normally confined to purely technical matters. But even here technical judgements which ignore community experience and consensus opinion have sometimes led to disaster, as noted above.

The average area irrigated per user at the four projects visited ranged from one-half to two hectares, and all users were small, resident, campesino families.

ACHIEVEMENTS TO DATE AND 1982 GOALS: At this writing, four small irrigation systems have been completed. Collectively these irrigate a total of 1,090 hectares and benefit a total of 1,342 families. Seven systems are under construction. These are programmed to irrigate another 1,389 hectares and benefit an additional 910 families. The total cost of the eleven systems will be about US\$940,000. Of this amount, about 29 percent is contributed by the users, another 6 percent by the implementing agencies, and 65 percent by Title III.

Although the project encountered considerable difficulty in getting underway--in part due to political instability and severe internal disruptions within the SNDC--today the pace of project execution is intensifying. Beside the 11 systems completed or under implementation, two new systems are in the field design stage and 12 other designs have been approved. These 14 additional systems are scheduled to begin construction in 1982 and are programmed to irrigate 4,990 total hectares for the benefit of 3,585 families. Meanwhile, the feasibility of still additional systems is currently being investigated.

FUNDING TO DATE: Against a 1979-81 approved budget of US\$1,507,000 for irrigation system construction, the Executive Secretariat actually disbursed US\$856,721. The SNDC has requested US\$611,300 in PL480 funding for calendar year 1982. To date, Title III monies have been used chiefly for the purchase of construction materials and vehicles, and to contract SNDC personnel and their support costs. As noted previously, SNDC contributions to project costs are minimal, about 6 Percent. While this almost full support of project operating costs by the PL480 Program can be viewed as counterproductive from the viewpoint of strengthening SNDC operations, on the other hand such generous backstopping has given the irrigation unit--now detached from the central SNDC bureaucracy in La Paz--the support it requires to implement its activities in an efficient fashion. Thus, the project has been somewhat insulated from the negative effects of Government austerity measures that have so badly disrupted other GOB projects financed under the Program.

2. Findings at the Institutional Level

Both the SNDC and CODETAR have identified, designed, and executed projects of high local impact and enormous user acceptance. One of the strengths of the SNDC lies in its network of campesino field agents known as promotores. These indigenous paratechnicians live and work in the area of the projects they serve. They speak the Indian languages, they come from the same socio-economic strata as the community residents with whom they work, they travel on foot or by bicycle, they require negligible logistical support, and their low salaries (perhaps too low in the opinion of many observers) makes it very inexpensive for the SNDC to use large numbers of them. Many, if not most, promotores (male and female) have worked with the SNDC for many years, during which time they have accumulated a vast amount of experience and pragmatic technical skills in a variety of fields. Their main functions are to promote, organize, monitor, and assist in the back-stopping of community development projects. Another name for these talented campesinos which has been used repeatedly in this report is the now-familiar "farmer-paratechnician", a concept which has probably been more thoroughly tested in Bolivia (and successfully so) than any other country in Latin America.

With regard to CODETAR, this agency has financed a significant portion of the construction costs of the Erquis project from its own budget. From a design viewpoint, it has established a much more sophisticated development model because the irrigation system has been integrated with complimentary dairy, fruit, and forestation activities. Both agencies provide technical assistance throughout the life of the project and beyond, and both post resident supervising engineers to the site during construction. Recipient communities are usually identified by promotores who, in turn, organize local project committees who make a formal, written request for assistance and pledge what they can in cash, local materials, and unskilled labor. The SNDC requires from each soliciting community the completion of a socio-economic profile to assure that projects are located in truly poor communities, and to assist SNDC designers in developing a project feasibility study.

Both institutions have administrative departments which keep accounting and materials records for each project. Materials purchases, vouchers of delivered supplies, warehouse inventories, records of labor use and other community contributions, vehicle use, bi-weekly project progress reports, financial reports, etc.--all must be accounted for to the departmental office level and, in the case of the SNDC, to the central headquarters in La Paz. In both institutions, the evaluators found record-keeping procedures detailed and cumbersome, or simply too complete. As with other GOB-administered projects, SNDC under-disbursement of approved budget combined with complex, centralized accounting procedures has caused delays resulting in the untimely arrival of project resources. For example, at one site food-for-work rations arrived four months after the project was completed.

A problem reported at Tejahuasi provides an idea of how complicated irrigation projects can be because of self-help efforts by one community that upset the delicate balance of water use or land usufruct claims with neighboring communities. In Tejahuasi one community is constructing the retaining wall which will result in the reclamation of otherwise useless riverbed areas for agriculture, but now three adjacent communities claim the now-valued riverbed area being improved.

3. Findings at the User Level

In general there is strong user acceptance of the four irrigation projects where interviews took place. This is demonstrated both in respondent comments, and by the users' work and cash contributions. Frequently, respondents asked that their projects be expanded in order to capture more water, irrigate more land, or serve more families in the community; others requested that credit and marketing services be integrated with the irrigation system. Users were most frequently discouraged--even angered--by technical design failures, lack of technical supervision during construction, and the provision of insufficient tech-

nical assistance in irrigation engineering and agronomy.

BENEFITS: As usual, project users identified an ample and logical array of project benefits. These are presented in order of importance as follows: (1) change to more profitable crops, such as fruit, flowers, and vegetables (15 responses); (2) availability of irrigation water increased (12 responses); (3) more land could now be irrigated more frequently (11 responses)--which reflects the fact that several systems are constructed over smaller, older irrigation structures; (4) family income was increased (11 responses); (5) Area planted and size of plots had increased (8 responses); (6) yields had increased (7 responses); (7) it was now possible to multi-crop--up to three crops per year (6 responses); (8) now possible to fully utilize lands previously cropped only seasonally (3 responses); (9) formerly useless land had been restored to productivity--the river bottom at Tejahuasi (2 responses); (10) the irrigation system had created a convenient household water supply (2 responses); and (10) the community was now able to irrigate its collectively-farmed lands.

PROBLEMS: Fourteen user-respondents answered the question: "What have been the project's major problems?" In order of importance their answers were (1) poor logistical support and supervision of the project --i.e., the cement and other outside materials arrived late, transport was scarce, skilled laborers not paid opportunely, etc. (6 responses); (2) faulty technical design--i.e., retaining wall collapsed, footbridge lacking, etc. (5 responses); (3) hard, manual labor resulted in the illness of some users (3 responses); (4) labor was scarce, cash contributions difficult to collect (2 responses); and (5) community misunderstandings occurred because of poor project promotion efforts (2 responses).

RECOMMENDATIONS: Just about 25 users or community residents were contacted, from whom 50 recommendations were collected. In order of their importance, the most frequent statements can be categorized as follows: (1) next time, listen to the community's opinion! (7 responses); (2) an expansion of the system is advisable (5 responses); (3) extend the primary canal (3 responses); (4) line the primary canal along its entire length (3 responses); (5) enlarge the retaining wall--at Tejahuasi (3 responses); (6) design an equitable water distribution system (3 responses); (7) secure product markets (3 responses); (8) provide agronomic technical assistance (3 responses); (9) build a footbridge across the dam--at Tuti Mayo (3 responses); (10) install a water meter on the system outlet (3 responses); (11) build household water tanks as part of the project (2 responses); (12) add production credit as part of the project (2 responses); and (13) make sure the engineers fulfill their work obligations (2 responses).

4. Recommendations

Users are strongly supportive of small scale irrigation projects, a fact they demonstrate with large resource donations--particularly their labor--and their clamor for follow-on additions to the systems or integrated support services. Traditional community mechanisms and norms guide water allocation decisions, the distribution of system maintenance responsibilities, and the settlement of water disputes. This approach is enlightened, and is probably the chief reason why irrigation projects function as effectively as they do. The SNDC has demonstrated its ability to identify, promote, design, execute, and administer these projects in such a way that high local impact is achieved and benefits incide upon the poorest campesino sectors. However, the SNDC needs to be encouraged to consult more closely with users regarding certain technical decisions, and to more closely supervise project construction. Finally, this project is seen as one which is almost totally dependent on PL480 support. For these reasons the following recommendations are in order.

RECOMMENDATION: The PL480 Program should maintain funding to this project at the Agreement level, i.e., US\$2.5 million over the five-year life of the project. The evaluation finds this project to be within the first-priority category.

RECOMMENDATION: Before the submission of the final technical plans and feasibility study for an irrigation project, it is suggested that the Secretariat urge the preparation of a statement--written by intended project beneficiaries--declaring that the design has been fully explained to them, they understand it and have no disagreements. In the event of any unresolved issues between the community and the executing agency, these should be recorded. It might also be expedient to design a simple brochure describing the participating community's rights and responsibilities with regard to the construction of an irrigation project, with suggestions on how to make the designing or constructing engineer accountable to the community, how to supervise the quality of his work, and what kinds of technical questions he should be able to answer with regard to the project.

RECOMMENDATION: Title III should promote the design and funding of one or two additional small irrigation projects managed by the Departmental Development Corporations. This would permit methodological and impact differences to be identified and studied.

RECOMMENDATION: The Secretariat should engage the service of a competent Bolivian hydrologist (or a civil engineer with substantial hydrology experience) to assess and report on the adequacy of the technical design at Tejahuasi, and to recommend any design changes that might be needed there. One week's effort will be sufficient for this assignment. Construction at Tejahuasi should be halted until the hydrologist's report has been reviewed.

H. SMALL FARMER CREDIT AND CROP INSURANCE PROJECT

Title III finances one of four U.S.-assisted small farmer credit lines within the Bolivian Agricultural Bank (BAB). Together these credit lines form the Proyecto de Credito a Pequeños Agricultores or PCPA. The PCPA operates a special window within the Bank's 83 agencies or field offices. An experimental crop insurance project known as ASBA (which stands for the Bolivian Agricultural Insurance Company) is tied to some 97 PCPA loans on a trial basis. ASBA is administered out of a separate Cochabamba office and is also financed with Title III funds.

During the evaluation institutional interviews were conducted at PCPA headquarters in Cochabamba, at the departmental PCPA headquarters in Santa Cruz, Sucre, and Tarija, and with BAB-PCPA field agents in Santa Cruz, Montero, Buena Vista, and Sucre. ASBA has two field agents, and both were interviewed in Cochabamba.

Campesino staff contacted or interviewed 68 PCPA credit recipients or credit agents from 34 communities in five separate departments. In Cochabamba 6 ASBA-insured farmers from four communities were interviewed. A severe frost occurred in this area and extensively damaged the potato crop there at the time user interviews were being conducted. Lists of officials, communities, and farmers contacted are presented in Annexes A and B.

1. General Project Description

The PCPA Project, according to the PL480 Annual Report for 1981, is designed to "increase the income level and improve the standard of living of the small farmer by granting loans with low interest rates and reasonable repayment periods." To these objectives the PCPA National Director adds the following: (1) to provide financial assistance to the poorest campesino sectors, (2) to shorten the time required for loan applications, and (3) to find an economical way to administer the program so as to make it eventually self-sufficient. ASBA has the complimentary objective of protecting small farmer crops and property from natural disasters, stimulating farmers to use (and risk cash outlays for) yield-enhancing technology, assuring subsistence of the borrower household, and securing the recovery of the farmer's invested capital.

Within BAB, the PCPA maintains a separate administrative identity at national and departmental levels. PCPA staff--although housed in BAB headquarters--are expected to devote their time exclusively to the small farmer credit activities. At the field level, the project is administered from the 83 BAB agencies by the same field agents; yet adminis-

trative autonomy is still maintained by a separate system of records and files, and through considerably faster and more flexible loan application and disbursal procedures than is the case with normal BAB credit lines.

Small farmer credit arrangements are very streamlined. An eligible small farmer goes to a BAB field agency to apply for a PCPA loan. He fills out a series of application forms which require neither proof of land title nor extensive legal opinion. Eligibility for the loan, its size, and its terms are determined on the spot by the field agent only, who uses a PCPA procedures manual for this purpose (revised as recently as January 1982). Eligibility and loan size depend fundamentally on the enterprise to be financed, its size, and on the farmer's net worth. Loans may not exceed 250,000 pesos (or US\$10,000 at the old exchange rate). Terms are up to 18 months for crop loans, and up to five years for investment credit (tools, buildings, livestock). The agent will make one or more farm visits at the application stage and again during the loan term. Interest rates have been 13 percent per annum but are soon to be raised to 21 percent.

ASBA requires the delivery of a PCPA loan. In addition. ASBA field agents enforce the use of modern production technology (i.e., more inputs and cash-intensive) as a condition on the issuance of a policy.

ACHIEVEMENTS TO DATE: According to PL480 records, 1,278 PCPA loans were issued to 2,486 campesino families between 1979 and September 1981. This compares quite unfavorably with a five-year target of 20,000 families and a 1979-1981 target of 6,560 families. Average loan size was about 73,700 pesos, or 29 percent of the 250,000-peso limit.

ASBA's first insurance policies were issued to 50 farmers in the 1980-81 agricultural year. During the present 1981-82 year 97 farmers have been insured.

Both projects have been seriously effected by the cutoff of USAID funds commencing in August 1980, and which is still in effect. Under-performance in terms of user numbers is probably attributable entirely to that cutoff, a point to be further discussed below.

FUNDING TO DATE: As of September 1981 Title III disbursements to the PCPA totalled US\$3.67 million for loan capital and US\$0.27 million for equipment and vehicles. The US\$3.67 million contrasts starkly with the five-year programmed disbursal of US\$15.0 million as specified in the Program Agreement. However, in total value of loans disbursed BAB-PCPA actually succeeded in disbursing US\$4.0 million in loans to small farmer clients. This was done through the able and agile management of reflow (repayment) funds, and by adding limited funds from other PCPA credit lines.

In 1980 Title III provided US\$1.0 million to the ASBA indemnity fund.

2. Findings at the Institutional Level

As an institution for agricultural lending, the BAB is not presently oriented toward small farmer clients and never has been. Instead, the Bank has always moved its resources toward large, highly capitalized, "creditworthy" farmers engaged in sugar, cotton, livestock, and other area-extensive agricultural enterprise. Loans to small farmers have been very few, and this type of client has been virtually excluded from the BAB's normal lending activities. The PCPA program has finally provided the Bank with a lending vehicle for reaching small, non-credit-worthy producers, i.e., those without land title or abundant attachable assets. PCPA loans are issued without legal proof of title with mostly just the financed harvest as guarantee. The average wait between application and disbursal has fluctuated in the range of two to 14 days! Timely disbursal to the intended users has resulted, in turn, with extremely high user acceptance and considerable field impact.

Reaction to the PCPA by BAB's field agents is a mixture of admiration, amazement, and awe. Fourteen-day disbursal delays to unsecured borrowers is simply impossible under normal BAB operating procedures. When discussing PCPA, field agents use such descriptive terms as violento (super-fast), oportuno (timely), and provechoso (advantageous). Field agents have effectively carried the PCPA service to its intended users: there were approximately nine qualified applicants for every loan issued for the 1981-1982 crop year. The evaluation failed to reveal a single case where a PCPA loan went to other than a small farmer qualified under the loan terms.

The PCPA has the lowest default rate of any BAB program--only 8 percent nationally under all four credit lines, and just 1.4 percent among Title III-financed borrowers. The evaluators are unaware of a lower default rate for an unsecured small farmer credit program anywhere else in the world.

During the evaluation interviews the following question was asked: Can the PCPA continue without Title III support? The answer to this question was a unanimous no. The PCPA is outside BAB's normal lending policies, and there is no way for PCPA users to qualify in competition with larger and more solvent borrowers. Neither does it appear that top-level Bank decision-makers want the administrative hassle of monitoring large numbers of tiny loans. And historically, fewer than 5 percent of Bolivia's farmers have ever received bank loans. It therefore seems reasonably certain that without Title III and other donor support, and despite basic sympathy for an agile small farmer lending program among the Bank's field agents, the PCPA would simply disappear from BAB when its external funding gave out.

SUSPENSION OF PCPA FUNDING SUPPORT: USAID/Bolivia ceased the disbursal of loan capital to all four PCPA credit lines after the mid-1980 coup of García Meza. Subsequently, the posting of unqualified administrators to the Cochabamba headquarters resulted in unauthorized and inappropriate use of PCPA vehicles and other (non-credit) resources. Even though the offending administrators have been removed from the project and the regime in La Paz has changed, PCPA loan capital support has continued frozen. The effects of the funding cutoff have been negative in the extreme, as follows: (1) the scope of the only effective small farmer credit program in Bolivia has been seriously reduced in all regions; (2) the number of loans has shrunk drastically as the real purchasing power of the peso plummeted; (3) the crop insurance experiment has been crippled because PCPA loans are so hard to come by now; and (4) an estimated 11,000 eligible loan applicants have had to be turned away.

PCPA and BAB are in the process of complying with a series of internal administrative reforms requested by USAID as a precondition for the unfreezing of loan funds. Otherwise, 1982 goals include continued decentralization toward the field agent level, continued streamlining of loan application and disbursal procedures, an increase in PCPA capitalization to support a greater volume of lending, and eventual full recovery of administrative and overhead costs. Meanwhile, the Secretariat received a request for disbursal of 30 million pesos (US\$1.2 million at the old exchange rate and only US\$682,000 at the new) for additional capitalization to support expanded 1982 small farmer lending.

ASBA: The crop insurance program is new and still very small (fewer than 100 clients). No claims were received from the 50 farmers insured during 1980-81 because it was apparently a bumper crop year; hence, the project remains to pass its first baptism of fire. Whereas 1,650 farmers were programmed to receive this insurance service in the 1980-83 period, non-availability of PCPA loans has kept performance at a tiny fraction of this goal.

The Insurance Company's field agents appear to have been quite effective in enforcing the use of advanced production technology in insured potato fields. According to an Executive Secretariat report, a comparison of crop performance results between insured and non-insured farmers shows that the latter hardly recovered the total cash investment in their crop, while the insured ones obtained significantly higher economic returns. However, in the opinion of the evaluators these results may be spurious if both groups surveyed did not enjoy equal access to credit and, more important, irrigation resources. Furthermore, the ASBA test area is rather atypical of potato growers of the nation as a whole because most insured farmers are located in or near the community of Melga, which is famous throughout the Cochabamba region for the quality and productivity of its potato crops. In this highly progressive, irrigated community, up to three potato crops are grown each year--hardly the norm for Bolivia as a whole--and a paved highway running past its

front door gives Melga residents preferential access to marketing opportunities, input supplies, and if necessary even daily visits by extension agents who can reach Melga by bus from Cochabamba in a mere hour. No, this is hardly the place to test an agricultural insurance scheme.

3. Findings at the User Level

Including PCPA credit users in the ASBA and Mairana maize projects, the total number of farmers contacted reached 67. These operated farms ranging in size from 0.25 hectares to 70 hectares (colonization areas) in area cultivated, with the average farm size 6 hectares and of these the average area financed only 3 hectares. Average loan size was 48,200 pesos (US\$1,920 at the old exchange rate), and the average loan term was 4.4 years. Out of sixty-five responses, 46 said the loan enabled them to obtain higher yields than in previous years (71 percent) while 19 said no. Of sixty-two responses to the question--Will you apply again for credit in the future?--61 said yes while the only no was given by a recently widowed wife. Users interviewed are predominantly small farmers with a strong market orientation, because the average amount of their financed harvest actually sold was 78 percent. Forty-four respondents said they used part of their PCPA loan to buy machinery, equipment, tools, oxen, wire, or other forms of productive capital. Of these same respondents, 43 also used their loan to acquire improved seed, 41 purchased fertilizer, and 37 bought insecticides.

BENEFIT PERCEPTIONS: Thirty-seven users said that their income rose as a result of their loan, while others were still non-committal because they had not had the loan long enough to complete the production cycle. But of the 37 with increased income, 20 gave as their primary reason an increase in yields, 19 credited an expansion in area cultivated, 12 shifted to more profitable crops, 9 cited technical assistance, 8 said it was because they expanded their productive assets, 6 gave credit to new technology, and only 5 said it was due to fertilizer. Respondents were also asked if they felt their living standard had risen as a result of the loan. Thirty-eight replied affirmatively. Of these, 20 said they had made homestead improvements, 17 said they now ate better, 13 said they reinvested it in farm or crop improvements, 11 acquired more land, 9 bought more production inputs, 8 said it just felt good having more money to spend, and 6 bought equipment and machinery with their new income.

PROBLEMS: Twenty-five respondents who said their income did not rise with the loan blamed this result on climatic factors (8 responses), low product prices (8 responses), harvest losses (5 responses), and untimely credit delivery (4 responses). Sixteen users who said their living standard had not changed again predominantly credited that situation to climatically induced crop failure (9 responses) or low product prices (6 responses. When asked directly if they had experienced any problems in obtaining their loan, 39 answered in the affirmative. The most

frequent problem cited was difficulties in presenting legal land title (19 responses), repeated trips to the bank to consummate disbursal of the loan (9 responses), late arrival of loan proceeds (7 responses), and excessive loan guarantee requirements. While these answers suggest that PCPA is by no means as agile as it is supposed to be, one wonders too whether what is being reported simply represents the results of normal credit agent inertia or indifference to the requirements of second-priority borrowers, or perhaps the squeeze on available lending resources due to program support cutback.

Users made 111 recommendations for credit program improvement, but of these only 17 (15 percent) had anything to do with loan approval and disbursement mechanisms. Forty-one responses requested follow-on technical assistance, 34 expressed the desire for higher prices and assured markets, 11 thought more funding should be provided for machinery and equipment purchases, 9 requested application procedure simplification, 8 wanted a lengthening of loan repayment periods, and 8 asked for more timely loan disbursal.

In closing it is relevant to mention that when users were asked if their loan was in arrears, 57 said no. Of the ten users who answered yes, 7 blamed market conditions, 3 cited a harvest failure.

4. Recommendations

RECOMMENDATION: Subject to a renewal of PL480 Program funding support by Washington, it is suggested that the Executive Secretariat authorize the expansion of loan capital resources in the PCPA credit line by about US\$10 million, raising the total to about \$14.0 million, which is the approximate level specified in the Program Agreement. If the average loan size of past years holds near the same figure--about US\$3,000--this would result in an estimated beneficiary coverage target of about 4,650 small farmers. And if average loan size conforms more closely to the figure obtained by this evaluation--or US\$2,000--beneficiary coverage could reach as high as 7,000 small farmers.

RECOMMENDATION: It is suggested that the Executive Secretariat continue to provide as intense and continuous field supervision to the PCPA as possible to assure that the availability of increased loan funds do not tempt the bank to subtly shift client emphasis toward slightly larger and larger farmers. In particular, the PCPA loan manual merits periodic review. In its 1982 version there is mention of minor shifts in client qualification criteria favoring those small farmers who have "surplus production" and an "ability to pay". Such terminology could easily result in the automatic disqualification of the smallest and poorest sectors of the small farm population because somebody happens to consider them "subsistence" producers with no significant market surplus. The appropriate strategy, rather, is simply to authorize smaller and smaller loans to progressively more marginal producers, but not cut them out entirely.

RECOMMENDATION: A sizeable restoration of PCPA's capital loan funds could undoubtedly result in a service delivery bottleneck. It is flattering to know that qualified small farmer loan applicants outnumber current users by nine to one, but given a massive resource injection into PCPA, can BAB credit agents administrate a ninefold increase in their small farmer clientele and loan volume? We think not. To assist with the solution of such a likely disequilibrium, the evaluation does not endorse proportionate expansion of BAB-PCPA technical staff, but rather suggests recruitment, training, and supervision of a cadre of farmer-paratechnicians. These part- or full-time campesinos would considerably extend the outreach of the Bank's presently available 83 field agencies at very low cost. It is recommended the PL480 make available to BAB/PCPA the requisite technical assistance to design and implement a coherent paratechnician strategy.

RECOMMENDATION: The ASBA insurance project is still very small and has yet to be adequately tested because it has been located, initially, in a relatively atypical, low-risk setting--Melga and its environs. The project's leadership is urged to consider the identification of more "average" small farmers so as (1) to create a more demanding test of agro-insurance concepts, and (2) to facilitate future replication of the project.

RECOMMENDATION: To improve its data base for statistical comparisons, ASBA officials are urged to make use of the agronomic information currently being collected under the Traditional Practices Project managed by Rural Development Services in 13 rural communities throughout Bolivia. In that project RDS has taught over 100 small farmers from the three major geographical regions of Peru to keep daily farm records of all activities, expenditures, and income accruing to all major crop enterprises. Detailed records now exist for over 25 crop enterprises. At least ten such records are being kept in the community of Melga itself. ASBA is welcome to consult these records, pending of course the approval of the campesino-owners of the information.

I. CAMPESINO SCHOLARSHIP FUND

PL480 resources finance scholarships to the children of poor campesino families. The project is administered directly by the Executive Secretariat, as the executing agency. The Secretariat works directly with the (currently) eight educational institutions granting the scholarships.

During the evaluation, institutional interviews were conducted at the Vinto School near Cochabamba and in the Executive Secretariat's offices in La Paz. The other seven schools were too remote to visit considering time limitations of the evaluators and with due consideration for rainy season transportation difficulties. At Vinto, some 18 students were interviewed in small groups, both boys and girls, but only the names of nine were recorded by the evaluators.

1. General Description of the Project

Currently this project calls for the funding of a cumulative five-year total of 4,430 scholarships distributed as follows: 62 percent to room-and-board students, 75 percent to male, and 25 percent to female students. Scholarships are given mainly at the secondary school level. To a much lesser extent, primary education, teacher training, and technical short courses are funded. Recipients are selected from poor farm families throughout Bolivia, with preference shown to children who could not otherwise afford to continue their education.

To date the project has financed a cumulative total of 850 scholarships, with 445 more programmed for 1982. The cumulative total is well below the agreed 1979-1981 target of 2,838. So far, thru 1981 Title III has provided US\$299,300 in scholarship funding. The Agreement-level funding for 1982 is US\$437,000

2. Findings at the Institutional Level

All eight benefitted schools are accredited and grant diplomas recognized by the Bolivian Ministry of Education.

Within the limited impressions provided by a visit to one school, the following generalizations appear to be justified. First, there has been full compliance with the intent of the Agreement. Scrupulous attention is given to assuring that recipient children come from the very poorest rural families throughout the country. Both the granting schools and the staff of the Secretariat review the socio-economic characteristics of recipient children to assure this. Second, the granting schools all give secondary school degrees, thereby satisfying--and in

practice exceeding--the academic norms of the Ministry of Education. Third, all schools emphasize applied training in trades, such as vocational agriculture, auto or machine shop mechanics, baking, dietetics, secretarial training, carpentry, electricity, drafting, and others. The Vinto School, for example, offers training in all these fields. Fourth, at all eight schools students typically receive a technical diploma as well as the normal high school academic diploma. Fifth, all students are also required to work in groundskeeping, classroom and dormitory construction and maintenance, food preparation and service, vegetable gardening, and so on. This employment helps defray the students' tuition and support costs. Vinto was granted scholarships for 60 students in 1981, but because of student employment this money actually supports 89 full scholarships.

PROBLEMS: The Executive Secretariat has been unable to meet its programmed targets for numbers of scholarships because it has been difficult to locate enough schools with the physical infrastructure to support scholarship students. Many candidate schools lack both dormitory and classroom space to accommodate more students. Frequently there exist physical plant deficiencies in school kitchens, classrooms, teaching equipment, and in other areas.

Moreover, the Secretariat has been reluctant to expand the project in the face of uncertain funding. This is not just a problem of inadequate resources but of time in which to apply them. Most secondary school curricula require three years. It is disasterous to contemplate the support of part of a poor campesino child's schooling, only to see him forced to leave school because the institution supporting him ran out of money.

At present the Secretariat supports the reprogramming of part of the unspent 1982-1984 Agreement-level funds into financing the establishment of profit-making businesses (e.g., bakeries, dairies, furniture manufacture, etc.) at recipient schools. Profits from these businesses would be used to finance future scholarships, thus making the fund self-sustaining.

3. Findings at the User Level

Five male and four female students were interviewed. All expressed positive opinions of the Vinto School. They said they came from very distant communities, sometimes arriving without a cent in their pocket. The work is hard, they agreed, but it was the only way possible to finance their secondary schooling. Several students expressed the opinion that they preferred to remain at the school during vacation periods than to return home; that way they could work even 10-hour days and thereby cancell off their scholarship obligation more quickly. None of the students said they received money of any kind for their physical labor on the premises of the school; to buy anything for personal use

it was necessary to ask for the money. One student said that he had had an accident (broke his leg) and the School financed all his health care, for which he was extremely grateful and planned to slowly work off at least a fourth of the cost incurred by the school. In general, the School supplies everything--all food, lodging, cash for bus fares, some clothing, and--most important--an education. Several students interviewed expressed their ambition to pass through the normal school curriculum so as to become rural school teachers. The only complaints heard involved long hours of work (5 AM until 9 PM), and the quality of the food (seldom any meat except on special days). Daily food costs per student are estimated at 45 pesos (US\$2 at previous exchange rate), which is equivalent to three hours of labor by the student, whose labor services are assigned an equivalent value of 15 pesos per hour. It is a spartan lifestyle to be sure, but in the last analysis --despite the many deficiencies--it results in an education. For the respondent children, it is the only way they would have a chance to continue their education.

4. Recommendations

RECOMMENDATION: The benefits generated by this project for campesino youth are considerable. The evaluation finds this to be a first-priority project, particularly in times of resource scarcity, because of its relatively low cost per student--about US\$150 per year--and its high user resource (labor) contributions. Were it possible to measure the lifetime difference in income benefits resulting from campesino students who do complete their secondary schooling versus those who do not, the benefit-cost ratio of this project would probably be astonishingly high.

RECOMMENDATION: It is recommended the Secretariat exercise great care --and adequate monitoring to judge results--in funding the establishment of small, school-based, income-generating industries. Successful examples of such enterprises are quite rare.

J. RURAL DEVELOPMENT STUDIES

The PL480 Title III Program Agreement specified the five-year budget of US\$1.3 million to finance a series of studies concerning problems affecting the small farmer which have not been adequately examined. The studies were originally to be approved and managed by MACA, but this ministry's internal instability and inertia regarding the project resulted in its administrative responsibility being taken over by the Executive Secretariat.

To date the Secretariat has spent US\$54,780 and financed three studies, as follows:

1. Agricultural Development Center

The Secretariat engaged Professor Julio Piñeda, Dean of the Pan American Agricultural School in Honduras, and Dr. Daniel Candia, Dean of Agriculture and Vice Rector of Gabriel Moreno University in Santa Cruz, to assess the feasibility of training middle-level agricultural technicians, to recommend potential school locations, and to recommend curricula for one or more Bolivian agricultural normal schools. The report was completed during 1979-80 at a total cost of US\$15,600.

2. Wheat Production and Associated Marketing Problems in Bolivia

The Secretariat paid all peso costs plus 1.5 man-months of salary support for a five-member team from the Food and Feed Grain Institute of Kansas State University to prepare this study. The report analyzes the Bolivian wheat sector and the activities of the Wheat Marketing Division of the Ministry of Industry (MICT). The report was completed in 1981 at a total cost to the Secretariat of US\$22,600.

3. OAS Projects Course

The Organization of American States delivered its regular short course in project preparation at four Bolivian locations in 1979-80. The Secretariat paid the cost of the course delivered in Trinidad, Beni. Twenty-two students from Beni and Pando Departments attended. As a result of the course four projects were prepared. These involved sawmills, rice production, cattle slaughter, and fisheries. The total cost to the Secretariat was US\$16,600. Furthermore, all four projects were subsequently presented to the Secretariat for PL480 funding.

4. Recommendations

An important purpose of the Rural Development Studies Project is to facilitate project identification, preparation, and feasibility study

analysis by several of the PL480 Program's implementing agencies, particularly the Departmental Development Corporations. It is the opinion of the Secretariat, shared by the evaluators, that the three studies financed to date do not fully satisfy the requirements of the Program Agreement, and that it is both necessary and desireable that further studies be financed. In particular, yet to be studied is the subject of non-wheat cereal production. Other topics of potential interest for study--already mentioned in this report--include strategies for transfer of ineptly-administered GOB projects to the responsibility of the DDCs, strategies for using farmer-paratechnicians to expand the service outreach of ongoing projects, and many other topics. It is desireable to have a studies budget for unforseen research needs, particularly to support the preparation of future project proposals such as those resulting from the OAS:short course.

RECOMMENDATION: The Program Agreement budgets US\$500,000 for studies during the 1982-1984 period. This amount could probably be cut in half without doing serious harm to the intent of the Agreement and the objectives of this project. But some fund for studies must be maintained throughout the Program's life, and for that reason the evaluation regards this as a first-priority investment.



INVESTMENTS FOR AGRICULTURE:

3. Left, an irrigation project at Achaca, in the highlands region.

4. Right, labor-intensive and physically demanding preparation of the soil. These campesinos are using traditional Andean footplows known by the Aymara name of huiso.



BOLIVIA'S VERSION OF THE MIRACLE OF THE BREAD AND FISHES



5. Laborers manually loading campesino-grown wheat at the MICT wheat collection center silos of Totora (Cochabamba)



6. Campesinos display their catch at a communal fishpond in Chuquisaca, a project sponsored by CORDECH.

I V. THE DEPARTMENTAL DEVELOPMENT CORPORATIONS

The Bolivian PL480 Title III Program supports rural development projects administered and implemented by nine Departmental Development Corporations or DDCs. To date, just short of 30 separate projects have been funded. These are listed in Table IV-A. During the evaluation five DDCs were visited: CORDEPAZ (Dept. La Paz), CORDECRUZ (Dept. Santa Cruz), CORDECO (Dept. Cochabamba), CORDECH (Dept. Chuquisaca), and CODETAR (Dept. Tarija). In these five departments a total of 11 DDC-implemented projects were visited by the evaluators, and these have been starred in Table IV-A. In all but one of these projects campesino staff conducted user interviews, which cummulatively totaled 49.

The 29 Title III-assisted DDC projects are disparate and developmentally interesting, but they are not the primary focus of this chapter. For more complete descriptions of the projects themselves the reader is referred to the Annual Report of the PL480 Program. Rather, the objective of this chapter is to describe the operations of the DDCs themselves, for these institutions are highly innovative and successful in their own right and provide a truly exciting development model. In the following pages will be presented a general description of how the DDCs operate. Next, a review of the DDC projects visited by the evaluators will be made for the purpose of showing examples of different approaches, functions, and strengths of the DDCs in practice. The chapter ends with a brief summary of user commentary about DDC projects in which they participate.

This chapter was researched by Michael Hanrahan and Nancy Hirschhorn; it was written by Hanrahan.

A. FINANCIAL OVERVIEW

The PL480 Program Agreement originally budgeted a five-year total of US\$15.0 million for the projects of what was then called "regional development committees". Subsequently, a separate project known as "Agricultural Development of the North Central Lowlands"--with a five-year budget of US\$2.5 million--ceased to be identified as one of the Program's ongoing projects. Its budget was presumably merged with that of the DDCs, raising the latter to US\$17.5 million. For 1979-1981 a total of US\$8.068 million was programmed for DDC projects; actual expenditures

TABLE IV-A: RURAL DEVELOPMENT PROJECTS OF THE DEPARTMENTAL DEVELOPMENT CORPORATIONS FUNDED BY PL 480-III

<u>Corporations and Sub-Projects</u>	<u>Start Date</u>	<u>Approved Budget</u>	<u>Disbursed Amount</u>	<u>% of Impl</u>
CORDECH (Chuquisaca)				
-Agricultural Training Center	7/79	17,690	17,690	100
-Corralón Mayu Sheep Center	7/79	369,713	369,713	100
-Rural Fishponds*	5/80	194,085	174,561	90
-Apple Production Nursery	5/81	<u>334,403</u>	<u>281,000</u>	<u>84</u>
		915,891	842,964	92
CODETAR (Tarija)				
-Integrated Poultry Dev.*	7/79	244,380	200,983	82
-Rural Potable Water Supply	10/79	66,689	66,689	100
-Coimata Fruit Nursery*	12/79	126,389	126,389	100
-Rio Erquis Diversion Dam*	-	<u>(67,748)^a</u>	<u>-</u>	<u>-</u>
		437,458	394,061	90
CODEOR (Oruro)				
-Rural Water Supply	6/80	263,189	263,189	100
-El Choro Sheep Center	5/81	<u>458,043</u>	<u>257,791</u>	<u>56</u>
		721,232	520,980	72
CORDEBENI (Beni)				
-Rural Water Supply	9/80	268,789	268,789	100
-Cocoa and Coffee Production	5/81	35,380	35,380	100
-Hog Production Center	5/81	89,309	58,710	66
-Trinidad Horticulture	5/81	30,360	16,090	53
-Guayamarín Hortaculture	5/81	30,785	16,175	53
-Artesan Fishing (INAN)	-	<u>-^b</u>	<u>-</u>	<u>-</u>
		454,623	395,144	87
CORDEPAZ (La Paz)				
-Livestock Health*	9/80	30,000	30,000	100
-Artificial Insemination*	9/80	106,562	106,562	100
-Sorata Apple Production	9/80	<u>168,415</u>	<u>90,196</u>	<u>54</u>
		304,977	226,758	74
CORDECRUZ (Santa Cruz)				
-San Javier Agric. Developmt.	1/80	77,501	77,501	100
-Mairana Corn Cultivation*	1/80	50,735	50,735	100
-Waterpond Construction	1/80	<u>181,029</u>	<u>100,343</u>	<u>55</u>
		309,265	228,579	74

Continued next page:

* =Visited by the evaluators

a. Assigned to the budget of the Irrigation Project, and not included in total approved budget.

b. Included in the budget of the INAN Nutrition Improvement Project.

TABLE IV-A: RURAL DEVELOPMENT PROJECTS OF D.D.C.s (Continued)

<u>Corporations and Sub-Projects</u>	<u>Start Date</u>	<u>Approved Budget</u>	<u>Disbursed Amount</u>	<u>% of Impl.</u>
CORDEPANDO (Pando)				
-Rural Road Construction and Maintenance	6/80	206,000	206,000	100
-Small Farmer Technical Assistance Center	7/81	<u>193,590</u> 399,590	<u>122,256</u> 328,256	<u>63</u> 82
CORDEPO (Potosí)				
-Rio Mulatos Sheep Center	6/81	469,927	268,096	57
CORDECO (Cochabamba)				
-Millu Mayo Forestation*	-	-	(140,000) ^c	
-Guinea Pig Production*(INAN) ^d	-	-	-	-
-Tarwi Production*(INAN) ^d	-	-	-	-
-Rabbit Production*(INAN) ^d	-	-	-	-
TOTALS		4,268,709	3,396,228	80

* = Visited by the evaluators

c. Assigned to the Forestation Project budget.

d. Assigned to the Nutrition Improvement Project budget and implemented by INAN with CORDECO cooperation.

Source: PL480 Executive Secretariat

finally approved by the Secretariat on an annual basis only reached US\$4.3 million, or barely half of the Agreement level, while actual disbursements were even less--some US\$3.4 million.

The low disbursement total for this project (relative to Agreement levels) must not be construed as evidence of limited absorptive capacity by the Corporations. To the contrary, the roughly 50 percent cut-back in budget was mandated by the suspension of Program funding by Washington in 1980. Furthermore, even as originally programmed under the Agreement, the expenditures for DDC rural development projects were designed to start as low as US\$1.4 million per year in 1979, then build gradually to an annual budget disbursement of US\$5.9 million in 1983. It must not be forgotten that we are talking about a cluster of nine regional development institutions, each possessing its own sophisticated technical and administrative staff together with planning and budgeting autonomy. Even if the aggregate resource commitment to this project--i.e., US\$17.5 million--were spread over five years and divided equally among the nine recipient corporations, the resource quota to be managed by each would not exceed US\$400,000 per year. In short, the evaluation finds the Departmental Development Corporations to be an institutional infrastructure whose capacity and potential is only just beginning to be tapped for the promotion of rural development activities.

B. GENERAL DESCRIPTION OF D.D.C. OPERATIONS

The DDCs are autonomous institutions. They have their own boards of directors, their own personnel and equipment, and--most critically--their own independent budgets and revenue sources. The DDCs receive indirect tax revenues or regalías from protected sources such as oil, gas, minerals, beer, and agricultural sector products--including sales of beef and coca. These revenues flow directly to the DDCs through the Bolivian Treasury but without legal interruption and disposition of the flow itself. Self-financed operating resources of the DDCs include vehicles, construction equipment, offices, administrative and clerical staff, office supplies, and project support materials and equipment.

The DDCs also have their own decentralized administrative structure which is autonomous and self-contained within each corporation. Administrative and accounting controls, personnel management, purchasing, and expenditure functions are usually confined to one or two administrative departments in the departmental headquarters of each corporation. Management procedures are reasonable, and work gets done with speed and administrative efficiency that is rare in Bolivia.

After the administrative departments, DDCs have technical and operational departments. Typically, these include departments of planning, projects, engineering, marketing, agriculture, and rural development. There are also standing inter-departmental coordinating committees on administration, finance, and project approval or management.

Virtually all DDC personnel are Bolivian nationals, usually born and raised in the geographic region they have been hired to serve. Many bring to their work a lifelong familiarity with the region, its problems, and its resources which serves to enhance both the perceptiveness of their project strategies and the efficiency with which these are implemented. Underlying the quality of DDC staff work is a fundamental sense of commitment and accountability to the clients and communities served by these corporations. Theirs are not considered transient jobs in a lifetime of public service employment but rather a career in itself. Thus, the stability of personnel is extremely high by the normal standards of public service. Such permanence is strengthened by generally higher salaries than those prevailing in the Government Sector for positions of equivalent responsibility. Combined with the relative absence of internal political unrest (as compared to Government jobs), the above factors make for considerable continuity in project development activities by DDC staff. And this great advantage in turn allows for the gradual accumulation of enormous experience in project implementation.

The evaluators found DDC staff to be of above average--and sometimes exceptional--quality in a wide range of specializations: agronomists, economists, veterinarians, civil engineers, forestry engineers, hydrologists, public administrators, accountants, and others.

Given high staff quality, and a work environment which encourages continuity and experience-based innovation, it is not surprising that all DDC project work is done internally. This includes project identification, design, feasibility analysis, promotion, finance, execution, and subsequent administration, management, extension, technical assistance, monitorship, and evaluation. The use of foreign consultants is quite rare. Of the very few cases of expatriate involvement, their participation has been associated with the more prominent DDC project failures to date (example: Tarija Poultry Development Project).

In summary, independent budget, autonomous administration, native staff, and nearly 100 percent internal project development responsibility have resulted in an exceptional degree of program continuity and efficiency rarely found in Third World development assistance activities. Bolivia's RDCs are an outstanding example of effective, locally-administered, decentralized development, and it is difficult to overstate their merits.

C. FINDINGS AT THE INDIVIDUAL PROJECT LEVEL

The DDCs are young institutions and still evolving in terms of their basic thrust. Normally the corporations would be expected to operate with a traditional, urban-biased view of development based on infrastructure investments--road construction, power, and potable water--and agro-industrial promotion. To date DDCs have initiated rice milling, corn processing, sugar refining, cement manufacturing, and some other industrial enterprises. However, one of the great achievements of the Title III Program is that it made available resources which have induced the Development Corporations to expand their normal portfolio to serve the lowest and poorest members of Bolivian society--the campesinos. Furthermore, involvement of the DDCs in the rural sector has been instrumental in shifting corporation resources away from a few but large undertakings toward a great many but less expensive project activities.

Some rural development projects of the DDCs have demonstrated highly perceptive--even brilliant--insights into local needs and how to meet them cost-effectively. In the first place, the DDCs are learning that small can be beautiful, and that small projects tend to create more abundant opportunities for active community participation in project design, execution, and replication. Second, projects are designed with an integrated focus--i.e., one project may be designed to alleviate bottlenecks in one or more other projects--or more simply they tend to merely compliment each other. Third, the concept of follow-through and continuity in support of rural communities is well-established. DDC technicians are aware that a completed rural development project is not the happy ending of a story but the beginning of a process which needs to be sustained.

These points may be illustrated by reference to specific projects. The provision of US\$30,000 in PL480 funds to purchase equipment for the Calletaca Animal Health Laboratory sponsored by CORDEPAZ served to eliminate a bottleneck in four ongoing livestock development programs sponsored by as many implementing agencies. The San Javier Livestock Development Project (CORDECRAZ) has reduced transhumance in that region, created a variety of highly replicable models for small livestock herd development, allowed colonists to make better use of their total holdings which formerly went uncultivated because of labor constraints, and finally has given local children--who no longer must accompany their families in constant seasonal migration--a chance to attend school.

Given the absence of hydrological records at Rio Erquis, the CODETAR engineer determined design characteristics of the weir, intake, and canal cross section through consultations with elder resident farmers. That project is user-constructed.

The Mairana Maize Cultivation Project supplies raw material to a CORDECRUZ processing plant that produces a variety of human and animal foods as well as industrial raw materials. CODETAR's Poultry (Broiler) Development Project provides an immediate market for its balanced feeds mill, and this in turn creates a market for its Chaco grain production projects. These examples are considered typical, not unique, of the DDC approach to rural development project promotion.

PL480 assistance to DDC projects has ranged from US\$16,090 (Trinidad Horticulture) to a high of US\$369,713 (Corralón Mayu Sheep Center), with an average for all projects of about US\$141,500. But regardless of its size, every DDC-sponsored project has a resident project manager. Generally, in the evaluators' visits to eleven DDC projects, it was found that project managers were technically competent, did in fact reside at the project site in most cases, and demonstrated to the complete satisfaction of the expatriate visitors their experience, commitment, enthusiasm, and high motivation.

The CORDEPAZ manager of the Calletaca Farm, who is also the Director of the Animal Insemination Project, is an agronomist with 17 years of experience in livestock production and has received training in animal breeding in Europe and the U.S. He is also a practicing farmer. CODETAR's manager of the Coimata Fruit Project is an agronomist with fruit production training at the University of California at Davis. CORDECH's manager of the Fishpond Project is an agricultural engineer with several years experience in fish culture. His project is one year ahead of schedule. In contrast, CORDECRUZ's manager of the Livestock Waterpond Construction Project only has a técnico degree, but he has spent his entire life in livestock production conditions almost identical to those faced by the project, and he understands the area livestock industry with his soul. Once again, these are considered representative, not isolated, examples.

Because of their financial and administrative independence, the DDCs can and do pay salaries high enough to attract and keep competent project managers. Complaints over low salaries were not heard at the DDCs --which is a welcome change from the endless lament over salaries which occurs in the ministeries.

Not only are DDC projects well-managed, but they show excellent follow-through by providing adequate field extensionists for technical assistance to users. For example, CODETAR's Coimata Fruit Nursery Project has five field staff technicians working as full-time extensionists. CORDEPAZ's Animal Insemination Project has two field veterinary technicians, one of whom is an Aymara. The CORDECH Fishponds Project has one full-time field promoter. This pattern of staffing--which is the norm on most DDC projects--also provides project managers with continuous and accurate data on project performance.

But perhaps more indicative of DDC follow-through is the policy of non-abandonment enforced by several Corporations: if the DDC can not itself finance the recurrent costs of a proposed project, and if it can not be placed on a self-financing basis either, the project is not undertaken in the first place. "We do not abandon our projects" was a slogan stated repeatedly during the institutional interviews. Due to this policy, DDC-sponsored projects have continued to function in the face of aid embarrassments by external donors while the projects of other agencies have slowed appreciably or stopped.

A number of RDC projects are designed to be self-sustaining after development assistance has ended. In such cases the users repay development loans, and the proceeds are then loaned to new participants. Two of the projects visited by the evaluators are presently functioning in this manner--the Mairana Corn Cultivation Project and the Cordillera Livestock Waterponds Project. Additionally, the fishponds, forestry, livestock, and fruit projects are designed to be self-sustaining once they are fully developed.

Partly as a result of PL480 incentive financing for rural development projects, several DDCs have become heavily oriented toward agricultural development. For example, in the case of CORDECRAZ some 41 percent of all professional staff and 30 percent of the total budget are dedicated to the agricultural sector. In contrast, the Government of Bolivia spends a mere 3.5 percent of its total budget on the agricultural sector (MACA and its dependencies.

PROBLEMS: Of the DDC projects visited by the evaluators, the most troubled was the CODETAR Poultry Development Project. Its sad history has been documented extensively in PL480 Annual Reports. The evaluators merely note here that the project was originated by USAID/Bolivia, and its execution was charged to a foreign consulting firm--TransAmerica--which USAID selected. In practice, the project turned out to be a very capital-intensive, high-technology operation channeled through a producers association composed predominantly of middle- to large-scale poultry producers, with the consequent exclusion of campesinos. This choice turned out to be fortuitous for small farmers because the project has yet to generate significant income benefits for its participants. TransAmerica abandoned the project in August 1981 because of internal disagreements among the consultants. CODETAR took over project management at that time.

The most common difficulty observed in DDC projects has involved marketing constraints. At Mairana, maize producers complained that the CORDECRAZ factory bought only enough grain to cancel member production credit obligations outstanding, forcing users into forced sales to intermediaries at inferior prices. In the INAN/CORDECO Tarwi Project, the processing plant was only able to pay 380 pesos per quintal versus a free market price of 600, and had no proven market for tarwi flour. With the

Fishpond Project, users have had difficulty selling carp which they do not consume themselves. A market taste preference test for this fish was not conducted prior to project implementation.

C. FINDINGS AT THE USER LEVEL

Nearly 50 participants in DDC projects were interviewed. Rather than a project-by-project enumeration of responses, user opinions will be summarized with regard to overall project acceptance, project impact on living standards, problems observed, and recommendations for the future.

The Tarija Poultry Project is the only one out of eleven visited where users were ambivalent toward their continued participation--and even here the participants interviewed were atypical of the lowest and poorest strata of the rural population which constitute the population normally targeted for DDC project assistance. At Mairana and at the Calletaca Animal Health projects, users hoped to continue with these undertakings but requested important changes. These were a CODECRUZ maize plant commitment to purchase all grain produced by project growers, and the provision of more mobile and less static-point veterinary services at Calletaca. The other eight projects enjoyed very high user acceptance, with participants unanimous in their expectation of continuing with the projects and hoping to see a future expansion of these activities.

On average, about seven users in ten reported that their incomes or living standards had risen as a result of their participation in DDC projects. Excluding the poultry farmers, the remaining cases involved participants in projects only recently initiated such that it was still too early to determine what benefits might have been generated.

The most frequently noted problems were low product prices, lack of markets, insufficient technical assistance. Not surprisingly, the most frequent suggestions touched the same subjects--more technical assistance and the provision of secure markets. By far, the largest category of user recommendations consisted of requests to enlarge projects--i.e., by capturing more irrigation water, constructing canal extensions, providing more production credit, more frequent mobile veterinary visits, more fishponds, more inseminations.

D. RECOMMENDATIONS

To repeat the recommendation stated at the outset of this chapter, the evaluation finds the DDCs to be a highly promising mechanism for the delivery of rural development services directly to the the poorest sectors of Bolivia's small farm population, and a mechanism whose potential has barely been tapped. We regard rural development by the DDCs

as a first-priority project. In the short-run (1982 and early 1983) the Program's resource scarcity dictates that no more than US\$2.0 million--of the presently available US\$7.3 million--be programmed for DDC project activities. However, granting a renewal of Program funding by Washington, we believe as much as US\$14.0 million in project support could be adsorbed by the DDCs during the remainder of the Program period (1982-1985). This amounts to about US\$1.5 million per Departmental Development Corporation over the next three years.

V. HEALTH SECTOR PROJECTS

The PL480 Title III Program provides funding for two major projects in the Bolivian health sector: Control of Communicable Diseases and Nutrition Improvement. The first of these is divided into five individual sub-projects: (1) Chagas Disease Research, (2) Tuberculosis Detection and Treatment, (3) Yellow Fever Control, (4) Malaria Control, and (5) Expanded Immunization Program. These sub-projects were evaluated in depth by Gerald Faich, a physician contracted by AID/OIH, who spent two weeks in Bolivia investigating them--one week in La Paz and another in the field. Dr. Faich's report constitutes the bulk of this chapter.

In addition to the activities of Dr. Faich, campesino staff trained by Rural Development Services conducted visits to 14 rural health institutions to ascertain their capacity and performance for implementing immunization activities or other health services largely directed at rural children. Additionally, campesino staff interviewed 45 rural households from throughout four departments to ascertain opinions about the quality of health services received and related information. Data collected in this bottom-up fashion were summarized by John Hatch and inserted--wherever appropriate--under the caption "Findings at the User Level" following major sections of Dr. Faich's report. These findings were not collected in a rigorously scientific way and therefore must be regarded as impressionistic. We include them here only to provide broader perspective to the report by balancing the top-down perceptions of a medical professional with the bottom-up perceptions of rural people.

The Nutrition Improvement Project contains seven separate sub-projects. These are (1) Baseline Studies on Nutritional Status of the Bolivian Population, (2) Nutrition Education, (3) Iodized Salt Promotion, (4) Promotion of Guinea Pig Production, (5) Rabbit Raising, (6) Tarwi Production, and (7) Artisan Fishing in the Beni. The research and write-up for these nutrition project activities was conducted by Nancy Hirschhorn.

A. CHAGAS DISEASE

1. Background

There has been long-standing concern in Bolivia about Chagas' Disease. The vector and the disease are highly prevalent in many areas, but quantitative data are lacking. For this reason a large scale study was planned which would examine the geographic distribution of the vector, the prevalence of the disease in humans, and the disease's impact on the population. The study originally consisted of the examination of 25,000 households in 250 areas, and involved collection of vectors, 25,000 human sera, and 2,500 electrocardiograms. The study has been carried out by the Ministry of Public Health and Social Welfare (MPSSP) through the Division of Epidemiology.

Some AID funding was received prior to 1979, but PL480 monies were not first disbursed to the project until 1980 in the amount of US\$43,000. In 1981, US\$48,000 was allotted to the project. Since the total PL480 budget for Chagas research was programmed at US\$92,000, Program funding to this project is virtually complete.

2. Project Activities

The project has been reduced in size to 4,600 households containing about 21,000 persons. To date, some 1,500 houses have been studied, about 7,500 have been bled, about 500 electrocardiograms have been done, and about 4,000 triatomae have been examined using the coloration test. Triatomae positivity for T. cruzi has been about 27 percent. About 21 percent of houses examined have had triatomae with an average of some 5 triatomae per household examined; put another way, there have been about 15 triatomae per positive house. Serologies to date on approximately 2,000 people have indicated a positivity rate by IFA (Immuno-Fluorescent Antibody: measures body's production of antibodies) of 69 percent. While 500 electrocardiograms have been taken, only 25 have been read by a single cardiologist. Thus, it is clear that triatoma infestation rates are high, and that the infection rate of both triatomae and humans are quite high as well.

The plan for 1982 is to increase the number of field teams from three to five in order to reach the 4,600 households planned for the study. Once all data are collected, they are to be analyzed by computer.

3. Comments and Recommendations

While already reduced in size, the continuing study is enormous in its scope and complexity. It promises to give considerable information about triatoma infestation rates as well as human and triatoma infection rates correlated with altitude, demographic variables, house type, etc.

One technical problem is the reliability of the coloration test being used to determine T. cruzi infection rates of triatomas. Is the test sensitive or specific? Does it reliably differentiate T. cruzi from other trypanosomes? Another technical problem involves data processing. Data entry and processing will be an enormous and expansive task. It would appear that firm commitments for coding and processing have not yet been finalized (i.e., no contract has been signed) nor have any of these tasks been initiated, which suggests that the completion of the study could be considerably delayed. This needs to be addressed immediately.

It is not clear that electrocardiographic results correlate with a morbid natural history in humans. Finding abnormal EKGs will not, in itself, mean the disease has a negative growth impact on populations. It will be necessary to plan a follow-up study of those with and without EKG abnormalities, and with or without positive serologies, to determine the human impact. Also, every effort should be made to increase the EKG reading since it is now very behind schedule.

B. TUBERCULOSIS DETECTION AND TREATMENT

1. Background

Tuberculosis is an important cause of morbidity and mortality in Bolivia. It is estimated there are at least 80,000 active cases of the disease in the country for a prevalence of 1.4 percent. Although tuberculin testing has been limited, over 50 percent of the population (and predominantly rural residents) is thought to be infected--with the highest rates found in the Altiplano. Based just on the population served by the MSPPS, morbidity is estimated at 356 cases per 100,000. The disease has consistently ranked as one of the most frequent causes of deaths, accounting for about 4 percent of reported deaths.

The MSPPS has operated a tuberculosis program since 1967. It has a central office, department chiefs, and a diagnosis and treatment network. Functionally, the three main components of the program are: case detection, case treatment, and BCG immunization. Little systematic contact tracing or tuberculin tracing is done. Presently TB services are available at about 65 percent of MSPPS hospitals and 40 percent of Centros, resulting in 23 urban and 168 rural sites in 1980. Twelve new sites were added in 1981. Services generally entail the availability of microscopic examinations of sputum and of drugs. It is estimated that the 203 sites provide access to only 60 percent of the population.

In 1980 (1981 data not available), health units reported about 8,000 cases of suspected TB. Of these, 4,400 were confirmed; 44 percent by sputum exam, 22 percent by x-ray alone, and the remaining 34 percent by sputum and x-ray. In the same year, about 3,000 cases finished therapy and about 3,500 cases are continuing in treatment, while 36 percent of patients did not complete therapy. First line treatment is done with a combination of Streptomycin, INH (Isoniazid), and TAC (thiacetazone). It is estimated that 5 percent of cases are resistant (failure to clear sputum followed by resistance on culture). Usually treatment is given two times a week in a supervised manner.

Most hospitalizations for TB occur because of the severity of the disease, drug resistance, or the presence of a major complication. The average TB hospital stay is 51 days in duration. Of the 4,400 confirmed cases in 1980, 780 (18 percent) were hospitalized. Some 360 hospital beds in the country are designated for TB.

From 1969 to 1976 a massive BCG campaign was mounted for those under 19 years of age. During this period 1.9 million doses were given. In 1976, all school children were surveyed; 72 percent of 264,000 students had a BCG scar; the remainder were immunized. The ongoing BCG effort is primarily focused on newborns. Of the 250,000 births per year, about 70,000 occur in hospitals and about 80 percent of these are immunized. In 1980, 158,000 doses of BCG were given, of which 55,000 went to children under one month of age.

In 1980, 28,000 chest x-rays were done under the TB program; of these, 6,700 were for diagnostic reasons, 5,000 for control, and the remainder for other purposes. In the same year about 28,000 sputae were examined, and of the 15,000 for diagnostic purposes, 24 percent were positive.

The PL480 funding for Tuberculosis Detection and Control activities was budgeted at US\$582,000 for the five-year period, of which about \$249,000 has been spent to date (1980-81). PL480 funds were allotted to acquisition of jeeps, improved equipment (microscopes), and acquisition of second line drugs (such as rifampin) to improve treatment. At the same time the MSPPS budget for the TB program has remained at about US\$80,000 per year.

2. Program Activities

Although delayed, vehicles and microscopes have arrived. These have contributed to the expansion of a number of TB treatment sites. Drug supply has apparently improved at some sites, but field visits indicated that there are deficiencies in the supply of both first and second line drugs. It appears that the main problem in the program is not diagnosis but rather treatment of diagnosed cases. Meanwhile, the BCG program has been moved to the National Immunization Program (EPI) described below. This should facilitate supplies, access and use of the cold chain, and may lead to increased treatment coverage.

3. Comments and Recommendations

The number of diagnosis and treatment sites has been increased. First line drugs are often in short supply, however, and efforts should be made to correct this before diagnostic capabilities are expanded further. More field supervisory visits are needed to make sure that drug supply breakdowns are not resulting in unnecessary lapses in treatment. The supply problems appear to be more serious between the central to departmental levels than between the latter and the field treatment network. The BCG program under the EPI needs to be monitored closely.

The number of hospitalizations should be reduced, or at least the length of stay should be shortened. Ambulatory care should be given the greatest emphasis since it is the most cost-effective. Since resistance to drugs appears to vary greatly, more culturing should be considered--particularly for selected areas like Cochabamba.

4. Field Level and User Level Findings

In visits to 15 rural health institutions, campesino staff asked the personnel of these centers to state what they viewed to be the health problems they treated with most frequency. Far and away, TB was cited as the most frequent problem (16 responses), followed by gastroenteritis (9 responses), malnutrition in pre-school children (5 responses), and bronchitis (4 responses). BCG doses were found in two of eight rural hospitals and two of three rural medical posts. In household interviews, out of 45 families, 8 reported there had been a member of the household with TB during the last year; of these, 5 had been treated.

C. YELLOW FEVER CONTROL

1. Background

Bolivia was declared free of Aedes aegypti, the vector for urban yellow fever, in 1948 and apparently remained free of this vector until 1980. But in February 1980--ironically during a training program for entomologists--Aedes was again discovered in the country, in the city of Santa Cruz. The presence of the vector was subsequently confirmed by a WHO reference laboratory. This discovery was particularly important because Santa Cruz--a city of 340,000 people--is the capital of the eastern-most department of Bolivia and a major international air terminus. The department has large areas of jungle in which jungle yellow fever is well known. Soon after the discovery of Aedes in Santa Cruz, a nationwide survey was conducted at 68 localities in Bolivia which were considered amenable to Aedes proliferation. But this vector was found only in Santa Cruz and two nearby communities (Cotaca and Kilometer 15) within 30 kilometers of the capital city. A comprehensive survey within the

city itself found the highest densities to be near the airport. This fact, combined with the absence of the vector in other localities tested, seemed to suggest that the importation was recent.

Reported jungle yellow fever cases in Bolivia totalled 10 for 1979, 48 for 1980, and 91 for 1981. The high incidence in 1981 was related to a large outbreak in the eastern part of the department of Santa Cruz in the town of Rincón de Tigre. Confirmation for some of the cases was by serology performed at Walter Reed and several by liver histology. Most cases of this outbreak and others over the years have been males, aged 15 to 44, who perform work involving clearing the jungle. There have been at least ten instances of jungle yellow fever cases entering the city of Santa Cruz in 1982, but no urban spread had occurred.

In 1980, US\$90,000 from the PL480 Program was allotted on an emergency basis (obviously, the yellow fever outbreak had not been anticipated in the Program Agreement) to allow for procurement of insecticides, larvacides, and spraying equipment. In 1981 an additional US\$180,000 in Title III monies were transferred to the yellow fever program from the malaria control program. No further PL480 funding is anticipated for yellow fever activities after 1981.

2. Program Activities

Activities have centered on three main areas: vector control and eradication, immunization, and surveillance. In the area of vector control, spraying in Santa Cruz and adjacent areas has been conducted by using malathion by ultra-low volume (ULV) and Abate as a larvicide. In areas of heavy infestation or those where an imported case of yellow fever has been detected, spraying cycles have been conducted weekly. For other areas, cycles have been conducted on a biweekly to monthly basis. The result of this has been that the vector has been eliminated from adjacent towns and from the inner and first ring within Santa Cruz. Aedes is still found in the third and fourth rings around Santa Cruz and most of the spraying activities are now concentrated in these areas. In early 1981 some 3,718 households were surveyed in and around Santa Cruz; of these, 147 were found to be positive for an infestation rate of 4 percent, but this had declined to below 1 percent by September of last year. Major efforts have also been made to eliminate standing water.

Yellow fever vaccine has been given extensively throughout the Department of Santa Cruz and in some parts of the Department of Cochabamba. Although no exact figures are available, it is estimated that about 600,000 doses of the vaccine have been given in the last two years. It is felt that the coverage of populations living around fixed facilities has reached 90 percent. On the day of the evaluator's visit, some 12,000 doses of vaccine were being given at the Public Health Unit in Santa Cruz. Considerable emphasis has been given to reaching persons living

adjacent to jungle areas, but because of the mobility and inaccessibility of this population, coverage has been far from complete. It should be noted that none of the cases of investigated jungle yellow fever had reported receiving vaccine.

In the area of surveillance, entomologic surveillance will continue in the city of Santa Cruz as will yellow fever case investigation. Already 31 cases of the disease have been detected in Bolivia during the first month of 1982. Since there has been no reported increase in monkey deaths in jungle areas, the increase in human cases may well be due to increased surveillance and reporting.

Planned activities for 1982 include an attempt to eradicate the vector if at all possible. This will be done by the use of insecticide and larvacide, and continuing efforts to eliminate stagnant waters. The continuation and promotion of immunization is also planned. At present, approximately 70 workers are employed in Santa Cruz by the Division of Epidemiology.

3. Comments and Recommendations

Ideally, considerable effort should be made to eradicate the urban vector. If this is done then the program could markedly reduce its other activities to only entomologic and human surveillance. If eradication cannot be achieved by midyear, then a reduction in the present level of activities might still be merited. If infestation rates can be kept below an index of 1 percent, the chances of an outbreak of urban yellow fever are small. This opinion is based on the low probability that a case of jungle yellow fever with viremia would be bitten by an Aedes mosquito which in turn would transmit the disease to a susceptible. A similar situation existed in Panama in 1973 and no urban yellow fever resulted.

Given the crossover in expertise and equipment between the yellow fever program and the malaria program, some consideration might be given to combining the two programs (along with activities for Chagas' disease).

The massive use of yellow fever vaccine in urban areas probably is not cost-beneficial even though it responds to a public demand. Yellow fever control in urban areas depends on vector control. In jungle areas, however, vaccine is the most appropriate since the vector Haemagogus cannot be controlled. As the urban vector is reduced, vaccine use in urban areas (excluding small towns adjacent to the jungle) should be de-emphasized.

D. MALARIA CONTROL

1. Background

The potentially malarious area of Bolivia encompasses about 75 percent of its land area and one-third of the country's population. In the 1950's many areas of the country had 100 percent prevalence rates for malaria. Following intensive malaria eradication efforts, largely supported by USAID/Bolivia, a low point in national malaria incidence of 378 cases was reached in 1969. Subsequently, in part related to the withdrawal of international funding, malaria frequency rose rapidly to 7,000 cases in 1974, 10,897 cases in 1978, and 16,619 cases in 1980.

The malarious areas of Bolivia are characterized by markedly varying topography and micro-environments. Three main areas exist: (1) the eastern foothills of the Andes including valleys found between the two mountain chains that cross Bolivia, (2) the Chaco area in the south, and (3) the Amazon region comprising a large part of the departments of Santa Cruz, Pando, Beni, and La Paz. The two main vectors in the country are *A. Pseudopunctipennis* and *A. darlingi*. The former tends to be an intra-domiciliary biter while *A. darlingi* is a peridomestic and outdoor biter that often rests inside houses. Generally in the areas where *Pseudopunctipennis* is the main vector, transmission primarily occurs between November and March during the rainy season. Transmission tends to occur year round where *A. darlingi* is the vector.

The vast majority of malaria in the country is due to *P. vivax*; only a small number (less than 5 percent) of cases are caused by *P. falciparum*. Almost all falciparum transmission occurs along the frontier with Brazil. In Pando and Beni, falciparum strains are drug resistant whereas in the Santa Cruz-Brazil border area they tend to be drug sensitive.

Malaria control in Bolivia historically and presently is based on three classic measures: (1) house spraying with DDT, (2) diagnosis and treatment of cases actively, passively, and through fixed health centers, and (3) surveillance based on active case detection (house-to-house) and passive detection based on voluntary collaborator posts. While an occasional attempt is made to do environmental manipulation such as draining of stagnant waters, the vast majority of the effort consists of surveillance and DDT spraying. Little progress has been made toward integrated control. Occasionally mass drug treatment has been used.

Since the early 1960's the malaria program has had a vertical structure--National System for the Eradication of Malaria or SNEM--which continues to this day. There is a central headquarters in La Paz, a sub-central office in Cochabamba with the national laboratory and epidemiologic facilities, and there are seven malaria zone offices. The program within each zone has a chief, a laboratory, supervisors, evaluators who conduct door-to-door active surveillance and check spraying coverage, and sprayers.

Treatment presumptively is with chloroquine and primaquine either separately or combined for 3-5 days. In the three-day regime, pyrimethamine is usually added. Treatment modalities vary from zone to zone. Generally it is felt that 3-5 day treatment schedules are 80-90 percent effective. Resistant falciparum cases are usually treated with quinine combined with a sulfa drug since resistance to Fansidar (a sulfa-based drug used for normal treatment) has been documented in Bolivia.

Bolivian expenditures for malaria control have remained constant in 1980 and 1981 at about US\$900,000 per year. In 1980, US\$700,000 of PL 480 funds were made available to the program, while in 1981 (in part to cover loss of resources to the yellow fever program) the figure rose to US\$1.2 million. PL480 funds have been used to buy 48 vehicles (jeeps) for field staff, acquire supplies of DDT (the appropriate waiver of the prohibition on its use was duly obtained), and to employ additional personnel. In 1980 the Bolivian Government funded 332 people in the malaria program while another 80 were funded by Title III.

2. Program Activities

The overall goal of the malaria program is to reduce malaria to a level where it is no longer a public health problem. Program progress can be evaluated by looking at the number of slides taken through the surveillance system, the number of positive cases for malaria, and the number of houses sprayed. Table V-1 (below) shows that a roughly 50 percent increase in the number of houses sprayed and the number of slides taken has occurred from 1979 thru 1981. During this same period the malaria rate has declined substantially. The same pattern is most striking for Cochabamba and Santa Cruz, where there was about a 100 percent increase in sprayings and slide-takings. Generally about 80 percent of slides taken are by active case detection, and these had a positivity rate of about 5 percent in 1981. The 20 percent of slides taken by voluntary collaborators had a positivity rate in the vicinity of 16 percent. The figures vary considerably from zone to zone. Analysis of data by departments shows that for the first half of 1981 the rate of slide positivity overall was 7.5 percent, with the highest rates found in Beni (13 percent), Santa Cruz (8.8 percent), and Tarija (9.5 percent). Of considerable importance to remember is that slide positivity rates for the first half of 1980 and 1981 indicate a decline in positivity from 13.5 to 7.5 percent overall. The 1981 total case count will be in the vicinity of 11,000. About 5 percent of positive slides were for falciparum malaria of which virtually all occurred in the Beni and Pando areas.

Based on field visits to Santa Cruz and Cochabamba, it is apparent to the evaluator that many areas in these two very large departments are now clear of Malaria. In such areas the plan is to reduce spraying to once a year and to continue active surveillance to insure that malaria is not reintroduced. The ready clearing of malaria transmission suggests that while two-thirds of the country is potentially malarious, much of the

TABLE V-1: MALARIA CONTROL AND INCIDENCE AT THE NATIONAL
LEVEL, AND IN SANTA CRUZ AND COCHABAMBA
(1979-1981)*

<u>Location</u>	<u>N O. O F C A S E S (I N 0 0 0 's)</u>									
	<u>Houses Sprayed</u>			<u>Slides Taken</u>			<u>Slides Positive</u>			
	1979	1980	1981	1979	1980	1981	1979	1980	1981	
<u>Entire Country</u>										
-1st 6 mos.	48.4	72.3	76.1	55.1	71.8	77.0	7.4	8.3	5.8	
<u>Santa Cruz</u>										
-list 6 mos.	8.1	14.4	16.7	9.9	15.0	15.4	1.2	2.0	1.4	
<u>Cochabamba</u>										
-entire year	12.9	20.7	23.9	19.4	21.7	32.8	0.6	1.2	0.6	

* Note that the first semester only is given for National and Santa Cruz totals, while entire year is given for Cochabamba.

malaria has a tenuous hold. The actual extent of the malarious areas that are difficult to control is quite limited. In Cochabamba, for example, most cases now occur in three relatively small areas: Campero, Mizque, and Chorcas. No recent studies of vector behavior, vector density, and vector resistance have been done, but these are planned.

Ease of access to areas of active field operations has been greatly facilitated since the receipt of PL480-funded vehicles. DDT supplies have been sufficient during 1981, but there may be a shortage of DDT for 1982. DDT shipments are often delayed due to difficulties in obtaining dollars at the Central Bank, particularly with tightened austerity measures now in effect. Delays in purchase and customs clearance have also been experienced.

3. Comments and Recommendations

Generally the program has made tremendous progress in the last two years and this is to be applauded. Work outputs have doubled and malaria incidence has been reduced by about 40 percent. Good data exists to continue program evaluation. Still, there is room for improvement. Further studies of vector density, resistance, and behavior are needed; these are presently underway by a three-man Chinese team and are of considerable importance.

Increased field supervision at all levels should be undertaken to make sure that the quality and intensity of required spraying and other community-level activities are adequate. User commentary collected by campesino staff would suggest that lapses in malaria control services are by

no means rare occurrences (see below). An attempt should be made to increase flexibility between the malaria zones so that personnel and materials might be moved across zone lines when needed. It may be appropriate to have floating teams located in the central or zone offices who would be available to reinforce efforts in areas requiring intensified effort from time to time.

Greater effort is needed in the Beni and Pando areas regarding the drug resistant falciparum malaria. Intensified effort should include much more rapid slide submission and reading. This might entail the installation of improved laboratory facilities in the area. Additionally, increased spraying should be done.

An attempt should be made to determine what constitutes optional treatment, and whether there is sufficient justification for treatment regimes that vary from zone to zone. Since vivax strains are sensitive to chloroquine and primaquine, the addition of pyrimethamine probably adds little to treatment success and complicates logistics. Studies to determine the duration of treatment--3 days versus 5--might be considered to measure differences in their relative effectiveness.

Some consideration might be given to incorporating yellow fever and Chagas' disease activities into the malaria program. The main justification for such a step is that much of the expertise, manpower (entomologic and spraying, and materials for vector control are already found in the malaria program.

Because of the inevitable financial pressures in the future, consideration should be given to concentrating on areas in the attack phase and lessening some of the activities for areas in the consolidation phase. This would entail changing the program to a more epidemiologic basis, where teams would float in relation to need. This change is entirely in keeping with the change from malaria eradication to malaria control. This would imply that many areas would not be sprayed until malaria is actually detected. To be effective, increased surveillance would be needed and a rapid intervention (spraying) capability would have to be maintained.

4. User Level Findings

At the community level, 29 families were interviewed whose houses had been assigned a malaria control number. (Of these, 17 were users interviewed under the Small Farmer Credit Project, with whom an add-on question about malaria services was included in the interview). Out of the 29 households, 23 (79 percent) had received a spraying on two occasions during the past year. One home received three sprayings, three received just one, and two more had been missed completely. Of the total number of households interviewed (45), only three reported cases of malaria during the last year, of which two had been treated.

The qualitative comments collected from users by campesino staff included a variety of dissatisfied opinions regarding the malaria control services. One elderly lady said: "The (malaria) sprayers used to work a lot better, but these days they are getting a bit lazy and give the house a half-spraying. Here in my house the spray didn't even get into the corners...Then this boy sat down and rested for a while, and I was feeding my chickens, so he asks me to sell him a chicken and wanted to know the price. I told him 120 pesos. But he didn't pay me with cash. Instead he gave me two bags of DDT (1 kilo) and told me not to tell anyone, and he left."

"The DDT sprayers", said another respondent, "are not very good. In vain they spray. They don't kill anything, not even a dead fly have I seen. Since I've never seen anything die I say they spray in vain, but they say it is against the chujchu. (malaria)."

At another community a respondent explained that malaria spraying coverage left much to be desired because if the sprayers failed to finish all the houses in a village, they might leave and never return to complete the unsprayed houses until the next round. Still another user volunteered that coverage and the frequency of visitation by sprayers depended on where one lived. "If you live on the road, they spray you three times a year. If you live a kilometer off the road you are lucky to get one spraying a year. Those families living further in never get sprayed at all."

Such comments as these are sporadic and should not be construed as representative of user opinion as a whole. Indeed, the quantitative data collected by campesino staff indicated excellent coverage (93 percent) of homes eligible for spraying. But the comments do suggest problems of quality control and therefore give support to Dr. Faich's recommendation for increased field supervision.

E. EXPANDED IMMUNIZATION PROGRAM

1. Background

Prior to 1977 there was little systematic immunization activity in Bolivia except for crisis-oriented campaigns stimulated by epidemics, the limited use of BCG vaccine, and private sector immunization of the upper and middle class. The Expanded Immunization Program (EPI) began in 1978 with an assessment of programmatic needs and the provision of technical assistance by the Pan American Health Organization. PL480 funding of US\$2.2 million for a five-year period was budgeted to support the program beginning in 1979.

The EPI is primarily geared toward immunizing children under three years of age with polio, DTP, measles, and BCG vaccines. The program emphasis is on simultaneous administration of vaccines as a means of improving coverage and efficiency. This is possible because there is no significant increase in adverse reactions or loss in immunity when vaccines are given simultaneously.

Requisites for conducting an expanded immunization program include a Government commitment; construction of an extensive cold chain (mainly refrigerators in rural health centers) to preserve labile vaccines; the purchase, supply, and distribution of vaccines; the training of personnel; maintenance of morbidity and vaccine distribution records; and the promotion of immunization in recipient communities. Generally EPI programs use a combination of fixed-site health facilities and mobile teams. PL480 funds have been used for the purchase of vaccine, syringes, vehicles, cold chain components, and the employment of personnel. Over the first two years (1980-1981), US\$808,000 has been spent in Title III resources.

Most morbidity information in Bolivia is based on routine morbidity reports sent in from health facilities and tabulated by the National Department of Health Information. Additionally, the National Epidemiology Division has personnel in each of the departmental-level headquarters (Unidad Sanitaria) who investigate outbreaks of communicable diseases and maintain a separate system for certain diseases including rabies, yellow fever, diphtheria, and polio. Morbidity data are incomplete throughout Bolivia and are not tabulated routinely by age. Mortality data are derived from the civil registration of deaths. Such registration, at best, encompasses 20-30 percent of the deaths in the country --with the majority of tabulated causes of death reported by nonmedical family members.

Paralytic polio tends to occur in epidemics every other year. The last occurred in 1979 (433 cases). The incidence of tetanus has remained constant with a mean of about 133 reported cases per year. Measles is a major cause of mortality in the under-five age group. For example, between 1968 and 1970, measles accounted for 5.8 percent of infant deaths in La Paz, and for 28 percent of deaths in the 1-4 year old age group. In Cochabamba, Santa Cruz, and for the nation as a whole, the case counts for polio, diphtheria, and tetanus remained stable or declined compared to previous years. Over the same period was reported a considerable rise in pertussis and measles--in part accounted for by improved surveillance and reporting. These trends are presented in Annex E, Table 1.

Few data are available nationally on the distribution of disease occurrence by area--urban versus rural--and by age. Where age data are tabulated, such as in Cochabamba, groupings of under 1, 1-4, and 5 or older have been used. (It would be more useful if the 1-4 age group would be divided into 1-2 years, and 3 plus years, to coincide with the age groupings used by the EPI program). The majority of cases of pertussis and meas-

les occur in children under the age of 5, as shown in Table 2 of Annex E. For example, 74 percent of measles cases were in this age group. Analysis of Cochabamba data for selected years by place of residence shows a predominance of polio and diphtheria in urban areas and a predominance of measles and pertussis in rural areas, as shown in Table 3, Annex E. Obviously, this distribution is effected by the nature of the surveillance system.

The last evaluation of the Bolivia EPI was done in December 1980 by T. Stephen Jones (CDC) of the Pan American Health Organization. His report noted that (1) immunization records were incomplete and disorganized; (2) a redesigned vaccine tally form (EPI-8) should be used; (3) a lack of accurate denominator information hampered the setting of objectives as well as evaluation of program performance; (4) sample surveys have not been used in Bolivia to determine immunization coverage levels; and (5) there had been some gradual increase in immunizations between 1977 and 1980 which reached about 40 percent of the target population under one year of age for the first dose of polio and DTP in 1980, and about 20 percent for the second dose, with measles coverage at about 12 percent (see Table 4, Annex E.)

2. Program Activities

STRUCTURE: The EPI is part of the National Division of Epidemiology. The epidemiologist in each department is responsible for the program. In many areas the staff of the maternal and child health program have assisted in supervision and implementation of immunization activities. One change in the program structure has been the transfer of the BCG immunization activity from the Tuberculosis Division to the EPI.

TRAINING AND PILOT AREAS: Major training sessions were held in 1979 by the Pan American Health Organization. Since then, field manuals and education materials have been prepared and distributed. These materials were available at all sites visited by the evaluator. All personnel contacted were well oriented about the program and its elements. In 1981, 461 medical personnel were trained in aspects of the EPI program. During the first six months of 1980, ten demonstration areas (areas de arranque) were designated as training foci. For these areas about 70 percent of targeted populations were reached with three doses of polio and DTP vaccine while 38 percent received measles vaccine. The increased effort in the pilot areas was largely abandoned at the time of the August 1980 coup.

SUPPLIES AND THE COLD CHAIN: The MPSSP and the PL480 Secretariat have both documented extensive distribution of these elements of the cold chain. Site visits indicated that these elements were in place and functioning well--i.e., temperature monitoring of refrigerators is being done. Vaccine, syringes, and needles appear to be well supplied in rural health institutions (at least to the Centro level).

DISTRIBUTION SYSTEM: Generally, department objectives are set at the national level. Within each department the epidemiologist sets local objectives and supervises vaccine supply and distribution. As noted in the Jones evaluation, objective setting is hampered by lack of age-specific population data. Generally a population estimate is multiplied by a fixed percentage estimate--usually 3.2 percent for children under one year of age. Additionally, an access percentage is applied--90 percent for urban and 60 percent for rural areas. Lastly, site-specific performance data now available are used to assist objective setting. Distribution is dependent on fixed sites and mobile teams. At many fixed sites all vaccines are available 3-5 days a week during working hours. For most rural sites, vaccine is provided for local campaigns that are conducted at three-month intervals with mobile teams (brigades) working out of a central point, and with adequate cold storage facilities rotating from one puesto to another.

RECORD-KEEPING: Most facilities have and use four components in record-keeping: (1) a patient immunization card (carnet), which is returned by the user at the time of the second visit about 50 percent of the time; (2) a clinical record (e.g., MCH) maintained in the facility, which is present for about 60 percent of children immunized; (3) a daily line listing of vaccines that is used to fill in the EPI-8, the cumulative report of immunizations given by dose number and age (and a copy forwarded to higher levels for tabulation); and (4) a family immunization card maintained at the facility. The EPI-8 tabulations are up-to-date at the departmental and national levels. These form the basis for tabulated vaccine coverage data given in the tables in Annex E.

RESULTS: Table 2, Annex E, gives national immunization levels. The coverage here and in other tables is based on total age-specific population estimates. The MSPPS prefers to use the estimated accessible population. For example, using an accessible population figure of 60 percent raises measles coverage for the under-three age group from 18.5 percent to 31 percent. Total population figures are used in this report, however, to allow comparability from one year to the next, etc.

In 1981 over one million doses of vaccine were given by EPI, which represents a 30 percent increase over the amount given in 1980 (see Tables 2 and 3, Annex E.) The data indicates that (1) highest coverage was for children under one year of age for all antigens except measles; (2) a sharp drop in coverage for children under one from first to third doses of polio and DTP (from about 40 percent to 14 percent); (3) some improvement over 1980 figures--such as the increase in measles coverage from 12 to 17 percent; and (4) forty-one percent of measles vaccine is given to children aged three or over.

Comparison of Cochabamba and Santa Cruz data (Tables 4 and 5) indicates that (1) both departments have higher coverage than the nation as a whole,

and (2) both departments show higher third dose coverage than second dose coverage--perhaps related to the validity of the information.

Comparison of urban versus rural data for Cochabamba and Santa Cruz (Tables 6-9, Annex E) shows that the capital cities of both departments have reached high levels of polio coverage. For children under one the figures for third doses are 76 percent and 48 percent respectively. This is undoubtedly due to the large-scale oral polio programs. In Cochabamba, for example, high polio immunization rates have been obtained because a door-to-door campaign was conducted in August and September 1981 using some 100 mobile teams. This was done to prevent a polio outbreak similar to that of 1979. It is unfortunate that measles vaccine was not used at the same time during the campaign.

Measles coverage in both capitals is also relatively high for children under one. The coverage is 51 percent and 44 percent respectively. In contrast coverage in rural areas is very low. For example, measles coverage in children under one is only 4 percent in Cochabamba and 17 percent in Santa Cruz .

Some comment is needed on the use of vaccine in children three years and older. For example, of 185,000 doses of measles vaccine given in Bolivia during 1981, 42 percent was given to children in the three or above age group. Apparently there is consumer demand for this practice which is based, in part, on the appearance of measles in the three or above age group. Secondly, in some instances documentation of vaccination against measles is required for entry into school. Then too, private physicians send patients to the centers to be vaccinated, demanding that vaccine be given to those over three. Finally, many providers of vaccine are reluctant to turn away patients requesting vaccine.

No separate vaccine distribution tabulations exist for the 112-man mobile brigades used in rural areas. It would be of considerable value to keep such statistics separately, and to estimate cost per delivered vaccine dose.

PROMOTION: The EPI has markedly improved access to vaccine, but coverage is still low. Data and conversations with program personnel and medical providers suggest that there is little demand for immunizations except during epidemics. This indifference is particularly common in rural areas, and relates to indigenous beliefs regarding health. One study in Monteros (Frerichs, UCLA) showed that modern health care is sought for only 20 percent of illness episodes even in an area where intensive promotion and provision of health services was attempted. While the regular supply of vaccine and improved access to vaccine will continue to increase coverage to some extent, epidemic control and further reduction of mortality and morbidity will depend on future promotion efforts.

In rural areas, increased promotion efforts will be as difficult as they are crucial. Possibilities include the use of malaria workers, promotion at fairs, markets, and on buses. Each department might consider intensive experimental efforts in one or two selected rural areas.

Many attempts have been made to improve turnouts for vaccination. One health center in La Paz Department conducted an extensive door-to-door promotional program in one of its zones using school students followed by several clinics held in that community. It was anticipated that 1,500 immunizations would be given in this way; only 500 were actually given. The same centro also tried using a tickler file to conduct home visits to children who were delinquent for second and third doses of vaccine. This effort was costly and not very productive because fully half of the addresses given at the time of the placement of the first dose were incorrect.

OTHER NON-M.S.P.P.S. INSTITUTIONS: More than 20 non-ministry institutions offer health care in Bolivia. The most important of these are the Cajas which together cover about a million persons. Generally the Cajas do not provide immunizations. They tend to refer their beneficiaries to Ministry facilities. The Cajas have contributed little to the purchase of vaccines through the Banco de Vacunas or Vaccination Bank.

3. Summary Comments and Recommendations

The EPI has made tremendous progress and appears to be working reasonably well. Within the Communicable Disease Control Project funded by PL480, it holds the greatest promise for reducing morbidity and mortality in a significant way. The program has stimulated both the aspirations of service providers and users. Should vaccine distribution be restricted in the future--as a result of funding cutbacks--disappointment and demoralization would result.

Regarding the strengths of EPI, it appears that the necessary training and organizational aspects of the program have been addressed very effectively. Supplies, vaccine, and cold chain elements are being properly used, well supplied, and fairly well monitored. Immunization records and tabulations have improved over the past year. Coverage of the target population has increased since 1980, although more in the urban than rural areas. The movement of the BCG program within EPI promises to strengthen distribution and application of the vaccine. This institutional shift needs to be monitored closely.

But much remains to be improved and significant weaknesses prevail. While improving, vaccine coverage is still quite low, and every effort must be made to overcome access, cultural barriers, biases of health providers against rural people, and infinite logistical obstacles. Second and third dose coverage is particularly low for DTP and polio vaccine (about 14 percent versus 40 percent for first doses). Major

effort must be made to get recipients of the first dose to return. A possibility for improving promotion communications may be the more intensive recruitment of village-level health workers from among local residents.

A large proportion of vaccine (30-40 percent) is being given to children over three years of age. This probably can be reduced by offering more training to health service providers, more rigid guidelines for use of vaccination materials, and demonstrations that disease morbidity and mortality drops rapidly for older age groups.

Monoantigen campaigns such as those for polio in Cochabamba and Santa Cruz should receive less emphasis as they detract from improving maintenance systems. When conducted, an attempt should be made to use multiple vaccines during these campaigns.

Efforts to improve immunization levels in rural areas need to be increased. This may involve intensified promotion techniques and expansion of the number of mobile teams. Concerted pilot efforts to reach urban populations in rural areas should be encouraged. Such efforts might include using media promotion, setting up clinics at markets, and providing vaccines on weekends or at night. In rural areas malaria workers could promote immunizations during their house-to-house cycles. Finally, supervision of health activities in rural areas is poor, in part due to transportation and travel expense restrictions mandated by recent GOB austerity measures. Once again, village health workers (particularly women) could play crucial roles in local promotion but also routine first-aid and simplest health services, thereby freeing up the time of more expensive health professionals for supervisory and logistical backstopping functions.

4. Findings from Interviews with Health Service Providers

Campesino staff visited eight centros, three puestos medicos, and three puestos sanitarios, all in semi-rural areas. In seven out of eight centros they found a refrigerator (a prerequisite for the cold chain), but only five were in working order. In the three medical posts, two had refrigerators--both functioning. In five of eight centros the campesino evaluators found stocks of vaccines (but only two had measles vaccine and only two had BCG). Of the polio and DPT stocks on hand, the average number of doses was 236. Two of the three puestos visited had all vaccines--with an average of 120 doses on hand for each--while the remaining post had no vaccines. Health staff of these institutions said that vaccine shipment occurred at three month intervals. Twelve of the 14 visited health institutions had received supervisory visits, but with a reported frequently averaging no higher than three times per year.

Health staff of the visited institutions reported a number of successes in the course of their work. In order of importance, these were (1) con-

sciousness raising among rural users of health services, who were beginning to acquire the "habit" of coming to the facility for assistance (8 responses); (2) they completed vaccination campaigns in all surrounding communities (5 responses); (3) there had occurred an increase in births attended by a health professional (4 responses); (4) the demand for home consultations was growing (4 responses); and (5) they had encountered greater acceptance by rural residents (4 responses).

The principal obstacles hampering the work of rural health staff were (1) lack of understanding or trust by farm families in modern health services (9 responses); (2) the campesino preference for traditional healers or curanderos (6 responses); (3) the lack of a vehicle (6 responses), and (4) continual staff changes (4 responses). The recommendation mentioned three times more frequently than any other was the establishment of a budget line item in health center operations expressly to finance training and consciousness-building activities destined to improve trust in, and demand for, modern health services.

When asked what were the most frequently treated health problems at these rural health facilities, the answers in order of importance were (1) pulmonary tuberculosis (16 responses), (2) gastroenteritis (9 responses), (3) malnutrition in pre-school children (5 responses), and (4) bronchitis (4 responses).

5. User Level Findings

Forty-five families were interviewed about their health status, their opinions toward public health facilities and use of the same, recommendations for improved services, and general commentaries. The average size of the families contacted was six persons. Twenty-one of 45 families had children under 3 years of age. Of the total population of children of three years of age or under (33), five died during 1981, which suggests a 15 percent mortality. Of the 45 households interviewed, 36 said they had utilized public health services or would go there first in case of a medical emergency. It must be stressed that in this respect the interviewed population is atypical of rural Bolivia as a whole. Of those households who sought public health services during the last year (23), the average number of visits made was two. When respondents were asked their reasons for seeking public health services, the answers in order of importance were (1) to obtain vaccinations (11 responses), (2) to treat measles (4 responses), (3) to cure a fever (3 responses), and (4) to purchase a pain-killer (3 responses).

When asked if there was a health facility nearby where they could take their children to be vaccinated, 37 of 45 households answered yes. Of those households with children aged three years of age or less--there were 20 children in all--20 had received vaccinations during the last year. Of all households interviewed, only one case of polio was reported. In contrast, 17 cases of whooping cough and 8 cases of TB were reported.

The 45 rural households were asked what were the principal benefits they received from public health facilities. In order of importance their answers were (1) we receive vaccinations for our children (31 responses), (2) we receive assistance for any medical emergency (11 responses), (3) the health facilities sponsor mothers clubs (6 responses), (4) they teach us how to feed our children (5 responses), (5) they give us foods for our children (5 responses), and (6) they teach us about hygiene, sewing, knitting, and cooking. In other words, overwhelmingly the rural family views the public health facility as an institution offering services which benefit children, and the specific service of vaccination was mentioned three times more frequently than any other. It is also evident that the salient method of health facility "entrance" into a relationship of trust with rural households is that of the mothers club or classes given to mothers.

Of course, the respondents also saw serious problems regarding the delivery of health services they needed. In order of importance, the major problems were: (1) families did not have enough money to buy the medicines prescribed for them at the health centers (18 responses); (2) the distance from the house to the health center (9 responses); (3) abandonment of the health center by its personnel, either because of temporary absences or resignation (8 responses); (4) discourteous treatment of campesinos by health center staff (6 responses), (5) the physicians are young and still do not know much about medicine (4 responses); and (6) children who had been vaccinated got sick with fevers or had been badly frightened by the experience. It is worth emphasizing that every one of these problems constitutes a very rational and justifiable reason for not seeking help at a public health facility. In other words, the argument of traditional beliefs and cultural barriers as obstacles to campesino use of health services may be much less important than outsiders would like to assume. It is more plausible to assume that poor quality health services result in poor user demand for those services.

Rural households interviewed also had a number of specific recommendations for improving the quality of public health services. These were, in order of importance: (1) that health staff remain in the centers for longer periods of time, to allow their rural clientele to gain confidence in them; (2) that each community have its own doctor; (3) that at least each community be visited once a week by a physician; (4) that doctors and nurses learn to treat campesinos like human beings rather than animals; (5) that malaria program sprayers also spray against the binchucas (carriers of Chagas' disease); (6) that health posts be equipped with the necessary equipment and medicines to offer a worthwhile service; (7) that efforts be made to educate the campesino about why he should not visit traditional healers; and (8) that communities be given general orientations about public health services, i.e., so they know what services might be available.

The following commentaries by rural inhabitants interviewed displays, we believe, a representative blend of some of the attitudes toward health services collected by the campesino evaluators.

ON THE NEED FOR A COMMUNITY HEALTH POST: "We are all agreed that a health post be built. At this time none of us have any money to pay for its construction, but we could raise the money by giving eggs, and chickens, and other products, which is what we used to do with Doctor Andrés."

EXPLOITATION OF A DISASTER: "The children were dying from yellow fever, and the sick ones only lasted one or two days, and that time I would calculate maybe 15 children died. First came the violent fever, then the diarrhea and vomiting....Then in the month of December a stranger arrived who said he wanted to vaccinate against yellow fever, and that he had been sent by the Unidad Sanitaria. But he didn't do it like others had. He rubbed the arm with a piece of cotton with alcohol, then made a bunch of little holes with a needle....So we became suspicious--the residents here and our representatives--and demanded to see his papers. He didn't have any. He wouldn't even give his name. We went to the Unidad Sanitaria, but nobody knew anything about that person."

POOR SERVICE AT THE HEALTH FACILITY: "We don't bother to go to the Posta because it's a waste of time. We go to find the nurse and she isn't there, and the patient with all that pain--and for nothing. It's even worse for families who live farther away."

"Building the health post was in vain. I've never seen the nurse there and I don't know him. Why bother to build a room for the enfermero if he doesn't live there."

FEAR OF VACCINATION: The children find out that the nurse is coming to vaccinate and they escape. They hide in the fields, or under the beds. Some mothers know how to hide their children so they won't get vaccinated, because they say the child is up all night with fever."

"My son is so afraid of the nurses that each time he sees a strange señorita come to the community he gets very upset. Sometimes when he's not behaving himself I tell him 'if you don't stop that immediately I'm going to call the nurse', and does that ever straighten him out!!"

F. THE NUTRITION IMPROVEMENT PROJECT

The final action project in the PL480 Title III Program, and the second of two health sector projects, is known as the Nutrition Improvement Project. It is managed by the National Food and Nutrition Institute (INAN) which was created in 1979 with Title III monies to provide technical support to the entire national food and nutrition system. INAN is a multi-disciplinary public sector agency charged with conducting and promoting baseline studies on nutritional problems, financing and evaluating experimental programs, developing short training programs, organizing nutrition education programs, and coordinating and evaluating subsidized food distribution activities.

During the evaluation institutional interviews were conducted in La Paz with INAN personnel, including the Administrator, Director of Research, and the Director of Training. The USAID Health and Nutrition Officer briefed the evaluator as well on the history and progress of INAN's activities. In the field, during interviews with CORDECO in Cochabamba, three experimental projects financed by INAN were discussed--Tarwi Production, Guinea Pig Raising, and Rabbit Production.

INAN has been concentrating primarily on carrying out nutritional research and educational activities. Their experimental projects have only recently reached the implementation stage. It was deemed premature to interview project users about benefits or impact; only a very few beneficiaries were contacted in the field.

1. Description of Project Activities

INAN has utilized PL480 funding to finance and or implement three types of activities--basic nutrition research, education, and applied nutrition projects. The purpose of this cluster of activities is to obtain insights relevant to the formation of nutrition policy in Bolivia, and to assist GOB and private sector institutions in implementing nutrition activities. For this reason INAN is located as a dependency of the Ministry of Planning. The Institute works closely with the ministeries of Planning, Public Health, and Education; it also works collaboratively with Departmental Development Corporations, CARITAS, and local civic committees. INAN's achievements to date are the following:

BASELINE NUTRITIONAL STUDIES: INAN has completed a series of nutritional studies including (1) Nutritional Status of the Bolivian Population, (2) Breast Feeding Practices in Bolivia, (3) Low Cost Regional Diets, and (4) The Nutritional Situation in the Department of Pando. These studies are now being readied for publication.

EDUCATION AND TRAINING: INAN has developed a textbook/teaching guide for a national nutrition education program. The document has been distributed for use in 10,000 primary schools. INAN has also given short courses to train urban and rural school teachers in using the document within the framework of a basic nutrition curriculum. The guide has been introduced in the primary school system on an experimental basis and INAN is evaluating that test with hopes of eventually extending nutritional curriculum development to the secondary and university levels.

INAN has financed a project to promote and market iodized salt in the departments of La Paz, Chuquisaca, Beni, and Pando. One thousand field promoters have been trained to work with mothers clubs regarding goiter avoidance and treatment.

EXPERIMENTAL PROJECTS: The Departmental Development Corporation of Cochabamba is executing three experimental nutrition projects under the supervision of INAN. The first is the Promotion and Consumption of Guinea Pig. The guinea pig is a traditional source of meat for indigenous households of Andean South America. The project purpose is to improve the quality of these animals through interbreeding with improved stock imported from Peru. A reproduction center has been constructed in Playa Ancha, Cochabamba, but bureaucratic and foreign exchange difficulties have so far prevented the planned importation of Peruvian breeding stock.

A second experimental project implemented through CORDECO by INAN involves Rabbit Raising. A reproduction center is operating and animals have been distributed to ten families along with basic technical information on their care and breeding. There have been delays in project coverage due to an inadequate supply of male rabbits to support an expanded breeding program.

The Tarwi Production Project seeks to promote the production and consumption of the highly nutritious tarwi bean, a traditional crop of the Andean region which in recent years has begun to be displaced by cash crops with more ready market acceptance. The Tarwi Project includes a training program, the cultivation of 250 hectares of this crop, the construction of a processing plant, and the promotion of tarwi flour consumption--along with recipes derived from its use--in the network of mothers clubs organized by the Bolivian public health system.

A final experimental project is Artisan Fishing in the Department of Beni. A cooperative of low income fishermen has been organized and trained to improve their catch of freshwater species to support a marketing plan in the city of Trinidad.

1982 GOALS: PL480 funding for INAN expired in December 1981. The GOB has picked up salary support of INAN staff for 1982, but with the economic crisis and official austerity measures in effect it is unlikely that INAN will be able to continue its activities at the same level as previous years. INAN plans to host seminars in March and May 1982 to disseminate the published baseline studies and to coordinate policies regarding nutrition improvement. INAN will be attempting to extend the nutrition education program beyond the primary level.

FUNDING TO DATE: The Title III budget for INAN, originally set at US\$ 1.0 million in the Program Agreement, was eventually reduced to US\$ 805,539 by joint agreement of INAN, the Executive Secretariat, and USAID. Of the reduced budget, US\$726,000 had been disbursed by the end of the 1981 operating year. Title III monies have predominantly funded salary support and operating costs of the Institute's first two years of existence.

2. Findings at the Institutional Level

It is always difficult to evaluate the impact of an institution which was organized primarily to conduct research. The task becomes almost impossible when the institution is just beginning its productive life, when its research findings have not yet been published or converted into policy recommendations, and when practical applications of the institution's expertise have not yet born fruit. For purposes of this evaluation report, there is no pending request to PL480 for continued support of INAN activities and hence the issue of whether or not INAN deserves continued support has become strictly academic.

For the record, however, based on a rather superficial assessment of INAN activities during the 1979-1981 period, it is the opinion of this evaluation that the Institute made a fairly small splash with the US\$ 800,000 in PL480 resources it was granted by the Program. It was originally proposed that INAN would undertake ten experimental projects; it began four, and none--as yet--have demonstrated dramatic success. The fact that these projects are being adsorbed into the portfolio of the DDCs is the only tangible sign that they may yet face reasonable probabilities of success, for their continued long-distance supervision by INAN from La Paz was clearly ineffectual.

3. Findings at the User Level

Three farmers involved in the production of tarwi were interviewed in the communities of Melga and Condor Punyuna. They reported that CORDECO had provided them with seeds and insecticides. The farmers were able to grow the crop on marginal land with a minimum of field work required. Their obligation is to repay CORDECO with seeds and the cash value of the insecticides. The farmers are free to sell to CORDECO or to private

buyers. The farmers have been getting a better price in the private market, they said, than from CORDECO, but since the Corporation advances inputs and adsorbs most of the risk of the venture, the farmers interviewed had reason to be pleased with the project.

4. Recommendations

The continuity of INAN seems assured through 1982 but with no guarantees thereafter. Its brief experience to date, financed with a resource injection of PL480 monies that was by no means modest, does not offer significant justification for its continuity. The fundamental deficiency of INAN--in our opinion--is that it is simply too ambitious in its intent. It seeks to be instrumental in the formation of national nutrition policy, yet it lacks the staff and the resources to maintain nationwide visibility and relevance. The basic concept of a planning unit specialized in nutrition is valid, but not at the national level--at least not yet. However, the approach seems tailor-made for the Departmental Development Corporations, i.e., regional nutrition experts working on regional nutrition problems.

RECOMMENDATION: The PL480 Executive Secretariat is urged to continue prudent monitorship of the experimental nutrition projects initiated by INAN, and to provide the participating DDCs--CORDECO and CORDEPO--all necessary financial assistance in expanding these projects as they become successful and merit replication.

RECOMMENDATION: It is recommended that the Executive Secretariat make sure that INAN invites representatives of the Departmental Development Corporations to attend its proposed seminars in 1982 regarding the results of its published studies. Copies of INAN published research should be widely distributed nationally, making sure copies reach all the DDCs regardless of whether or not they are able to attend the INAN seminar activities.

FORESTATION: THE NEED AND THE RESPONSE



7. Soil erosion in Tarija Department.



8. A community workparty pauses during its transplanting tasks in the Cochabamba region.

V I. B O L I V I A N G O V E R N M E N T C O M P L I A N C E
W I T H S E L F - H E L P M E A S U R E S A N D
P O L I C Y C O M M I T M E N T S

This chapter surveys GOB compliance to eight self-help measures and four policy commitments specified in the PL480 Program Agreement as a prerequisite for continued CCC disbursements to the Bolivian Food for Development Program. The chapter was researched and written mostly by Charles Connolly. Its text follows a memorandum prepared on the subject by Connolly prior to his departure from Bolivia, and already circulated within the Mission. Judgements regarding the adequacy of the policies themselves were edited in by John Hatch, and are largely based on recommendations found elsewhere in this report.

A. SELF-HELP MEASURES

In Part II Section V of the PL480 Program Agreement, the Government of Bolivia agreed to undertake nine "Self-Help Measures", as follows: (1) to strengthen the national plant health and quarantine program; (2) to continue and expand its network of agricultural service centers, (3) to intensify efforts to develop small farmer organizations and village infrastructure; (4) to continue to strengthen and expand its coverage of the small farmer credit program; (5) to continue to improve agricultural statistics and agricultural sector policy formation; (6) to continue to strengthen the Bolivian Agricultural Research and Extension System; (7) to expand the coverage of wheat collection centers to assure Bolivian farmers fair cash prices for their product; (8) to continue the upgrading of the national seed program; and (9) to continue to support the efforts of the national university in upgrading the facilities and curricula of the schools of agricultural sciences.

1. Strengthen the Plant Health and Quarantine Program

Since the date of the Program Agreement, the GOB reorganized and strengthened the Department of Plant Sanitation, raising the office to the level of a Division with two departments, Plant Quarantine and Pesticide Control. The GOB likewise opened one new frontier and four new interior inspection stations, bringing the total number of inspection posts to ten on the borders and nine in the interior. The existing laboratory for the former office of Plant Health received new equipment, and a new laboratory for the

analysis of pesticides was constructed. The inspection stations received 13 new vehicles plus office equipment and materials. The staff of Sani-dad Vegetal has grown from 16 in 1979 to 68, including 23 full-time line staff and 36 contract personnel. The two department chiefs received overseas training, while the inspectors and technicians receive periodic training in-country. A large part, but not all, of the costs of financing the above actions was financed with PL480 resources.

In short, the GOB has complied with this measure.

2. Agricultural Service Centers

Annex B, Project 4 "Farm Service Centers" calls for the construction and equipping of some 90 farm service centers, one in each province. At present four centers have been bid and awarded in mid-1981, but no construction has begun. The Executive Secretariat of PL480 has completed the technical design of 18 prototype blueprints for centers in different regions of the country. However, given resource cutbacks as well as MACA inertia in supporting this project, the evaluators suggest that no more than the first four (bid) centers be constructed, and that no more be authorized for construction until the performance and use of the first four can be evaluated (see page 43). Furthermore, the construction of any more centers at this time would be premature because the Ministry of Agriculture has not yet precisely defined its reorganization and decentralization strategy.

In short, the GOB has begun compliance with this measure, but meeting original implementation targets is considered impossible at this juncture and, more importantly, counterproductive. Non-compliance with this measure is recommended, pending the reorganization of the MACA.

3. Intensify Efforts to Develop Small Farmer Organizations and Village Infrastructure

Utilizing the AID Small Farmer Organizations Loan, the GOB formed four integral cooperatives. In 1980 the GOB formed an office (ONCICOOP) to support these cooperatives with technical and managerial assistance. Under the Program Agreement, 20 integral cooperatives were targeted for implementation. Given problems with the first four (now three) cooperatives, it is the unanimous recommendation of this and an earlier evaluation report that further organization of new integral co-ops be suspended until the first are consolidated and self-sufficient. (See page 39).

In short, the GOB has partially complied with this measure but further compliance would be counterproductive.

4. Continue to Expand Small Farmer Credit Program

Despite a lower than planned level of BAB lending to small farmers, the GOB has complied with this measure.

This measure is responded to with Title III proceeds in four ways. First, capital transfers to the Agricultural Bank of Bolivia (BAB) goes directly to the lending account of the Small Farmer Credit Program (PCPA), which received US\$3.7 million for this purpose but, by expeditious use of re-flows, was able to finance total onlending of over US\$4.0 million. Second, PL480 has provided US\$272,000 to finance vehicles and equipment for BAB branch offices handling PCPA lending. Third, the PL480 Program has funded the Aseguradora Boliviana Agropecuaria, an experimental farm insurance program, by providing US\$1.0 million for its indemnity fund which, in turn, insures crop investments financed under the PCPA program. Finally, Title III supports several rural development projects of the Departmental Development Corporations which, in turn, are linked to PCPA lending services. The PCPA program has also been strengthened by the move of the BAB's central headquarters from La Paz to Cochabamba.

5. Agricultural Statistics

The first area frame study, in the Department of Santa Cruz, was completed in 1980 with financing under AID loan 059. Following the 1980 coup, disbursements under this loan were frozen, and work on additional area frame studies ceased. Farm policy studies completed or underway include (1) two analyses of the southern valley area, carried out by U.S. consultants; (2) a socio-economic survey by MACA; (3) three Ministry surveys of BAB credit customers; and (4) the Traditional Practices Study being implemented by Rural Development Services, the contractor for the present evaluation report. In addition, the Bolivian Geologic Service in collaboration with the Departmental Development Corporations is producing a variety of maps covering land use potential in five departments based on ERTS satellite imagery. Finally, the National Statistics Institute in collaboration with MACA issued in 1980 a publication entitled "Agricultural Statistics, 1974-1979".

The GOB has therefore complied with this measure.

6. Strengthening the Agricultural Research and Extension System

The Bolivian Research and Agricultural Extension Agency (IBTA) has 12 experimental stations, 104 extension agents, and 4 production demonstration centers. With funding from the Interamerican Development Bank, IBTA has been upgrading its laboratories, offices, training centers, farm machinery, lab equipment, vehicles, and breeding stock. A further strengthening of the Institute would have occurred had it not been for the 1980 coup and the economic assistance cut-off, because at that time USAID/Bolivia in conjunction with IBTA had completed the design of a project proposal--loan funded--to establish a nationwide small farming systems research and extension scheme. Thus, compliance with the Measure is satisfied.

7. Expand the Coverage of Wheat Collection Centers

The Agreement sets forth two sets of actions which relate to this measure: the Wheat Collection Centers Project, Annex B, Project 1; and Policy Commitment B-1, Annex B, page 3. The collection centers were originally to have numbered 18, each with 616 MT capacity each. Given spiraling construction costs combined with austerity measures by the GOB, the targets for this project were scaled back, first to 12 stations of 616 MT capacity, then to four stations of 1,200 MT capacity, of which one is completed. Although ineptly managed by the Ministry of Industry, the wheat collection project has generated important benefits for small farmer users. It has provided them with a fair price, fair weighing, and most of the time an immediate cash payment for delivered produce. Meanwhile, on the price side, the GOB doubled the official wheat support price between 1979 and 1981.

The GOB has made some progress toward compliance. However, two successive evaluations of the project recommend significant improvements in the operations of existing centers before any additional ones are constructed. Hence, continued compliance toward this measure is considered inappropriate.

8. Upgrading of the National Seed Program

In 1979 the GOB jointly with the Andean Pact Office issued a study of improved seed production and distribution in Bolivia. The Ministry of Agriculture followed with an analysis of the seed industry, recommending the establishment of an autonomous National Seed Company. In May 1981, at the request of the GOB, the Andean Pact Office retained two advisors to draw up an organizational and financial plan for this company.

In a narrow sense the GOB has complied with the intent but not the letter of this agreement because no GOB national seed program yet exists which might be subject to expanded coverage and improved efficiency. Hence, it is accurate to say the GOB is moving toward compliance with this measure at the present time.

9. Upgrade Facilities/Curricula of Agricultural Schools

The GOB has not complied with this measure. There is no evidence of action by the Ministry of Agriculture or other GOB agencies in providing support as called for in this self-help measure.

B. POLICY COMMITMENTS

In Annex B, Section I of the Program Agreement, the Government of Bolivia agreed to undertake four policy commitments: (1) by 1982, a doubling in real terms of the GOB Agricultural Sector Budget; (2) reorganization of the Ministry of Agriculture; (3) during 1978-1982, maintenance of the GOB Health Sector Budget in real terms and apart from any PL480 proceeds; and (4) several marketing steps to increase the incentives for domestic wheat producers. Each of these commitments is addressed separately below.

1. Agricultural Sector Budget

This policy commitment states: "There will be a substantial increase in real terms in the public sector investment budget for agriculture for the 1978-1982 five-year period compared with the 1973-1977 period. For the period as a whole, the goal will be an increase in real terms of at least 100 percent. For each specific year, beginning in 1978, there will be an increase in real terms over the prior year consistent with the five-year goal."

The GOB has not complied with this commitment, and it has no realistic chance of doing so.

In describing performance under Commitment 1, the PL480 Executive Secretariat presented an agriculture sector composed of 14 entities, their annual budgets, and these investments adjusted by a Central Bank general price index deflator which yielded an average increase from 1973-1977 to 1978-1980 of 53 percent. The same sector presentation employing an agriculture wholesale price deflator yielded an increase of 37 percent.

The evaluator with USAID staff assistance undertook a different calculation using an expanded and presumably more realistic institutional matrix for the Agriculture Sector. This definition resulted in much higher investment levels for all years. However, when the general price index deflator was applied, the new model yielded even worse results. In absolute terms the rise in peso investment went from 21 to 76 million pesos during 1973-1977, and from there to 116 million pesos during 1977-1981. But these huge increases could not overcome a 1977-1980 inflation rate of 60-90 percent. Furthermore, when devaluation of the peso is accounted for, the US\$ equivalent of the Agricultural Sector budget grew almost imperceptively during the period--from US\$67.05 million to US\$68.6 million.

2. Reorganization of the Ministry of Agriculture

This policy commitment specified that the GOB would engage the OAS Inter-American Institute of Agricultural Sciences (IICA) to assist them in a total review and reorganization of the Ministry of Agriculture and its

decentralized agencies. The GOB complied with this commitment by retaining IICA to carry out the reorganization study, and the completed study was delivered to MACA in 1979. However, neither MACA nor USAID found the study acceptable, and after several attempted revisions, IICA abandoned the effort. Meanwhile MACA to this day has not yet undertaken a comprehensive reorganization and decentralization of its operations.

The GOB did not, then, comply with the intent of the policy commitment, which was not merely to initiate a study but to accomplish a major reorganization. That the ministry has still not achieved this objective is certainly understandable considering that since the IICA study was undertaken, which was nearly simultaneous with the PL480 Program start-up, MACA has rotated through its halls seven ministers and 16 sub-secretaries.

Does this mean that hope for a MACA reorganization is dead? Actually, there are grounds for optimism on this score. The evaluators had an informal breakfast meeting with the actual Sub-Secretary of Agricultural Affairs, Freddy Teodovich Ortiz, and several of his advisors. At this meeting we were shown a set of sophisticated planning documents prepared by Teodovich and his staff describing his strategy for a massive decentralization of MACA staff and budget authority to the regional level. The plan is so ambitious that it can be expected to attract considerable internal opposition from career civil servants of this huge agricultural bureaucracy. Admittedly, Teodovich's chances of pulling off this reform are slim, but if he somehow managed to succeed, the action could well provide the basis for a generalized revitalization of the entire agricultural sector and its service institutions.

3. Maintenance of the Health Sector Budget

Using Central Bank and Ministry of Finance figures, the Executive Secretariat reports that the health sector budget has increased in real terms since 1977: from US\$34 million to US\$76 million in absolute amounts, and from US\$34 million to US\$41 million when adjusted for inflation. The difference is in excess of total PL480 contributions to the sector so the policy commitment appears to have been met.

4. Wheat Production Incentives

It was first agreed that, subject to the capacity of the wheat collection centers, all wheat of acceptable quality brought to these centers by campesinos would be bought for cash without inordinate delay at the established price. As documented in this evaluation report (see pages 29-36), this first incentive has been provided and honored for the most part.

It was next agreed that new wheat collection centers would be built in accordance with targets specified in the Program Agreement. Compliance with this incentive was minimal, with one new center completed to date. However, the evaluation finds this non-compliance a fortuitous event, because MICT does not have the management capability of administrating efficiently an expanded wheat collection network. Hence, further compliance is inappropriate.

Finally, it was agreed that arrangements would be made to insure that Bolivian millers would buy domestically-grown wheat on a priority basis. This commitment does not explain what arrangements would be used to secure first-priority purchases of Bolivian wheat, or what first-priority means in the context of the existing processing and storage arrangements in private sector wheat mills. However, the fact remains that at this time the mills are in fact buying as if Bolivian wheat had highest priority, and in some instances the private millers are willing to pay higher prices to farmers than they can currently receive from the wheat collection centers. This commitment is met.

A N N E X A

LIST OF PERSONS CONTACTED:
INSTITUTIONAL EVALUATION

U.S. Embassy

Edwin G. Corr, Ambassador
William Price, Administrative Counselor
Allan Oslick, Economic Counselor
Daniel Strasser, Political Officer

U.S. Agency for International Development

Harry H. Bassford, Director
Robert Thurston, Rural Development Officer
David Johnson, PL480 Project Officer
Lee Hougen, Director of Health Division

Executive Secretariat of the PL480 Title III Program

Fadrique Muñoz Reyes, Executive Secretary
José Sanjinés, Economist and Head of Economics Division
Reynaldo Marconi, Economist
Gober Barja, Agronomist and Head of Agricultural Division
Jorge Noda, Economist and Health Sector Specialist
René Zumarán, Physician and Health Sector Specialist
Regina Iberkleid, Plant Pathologist
Felipe Contreras, Administrator
Germán Uriarte, Civil Engineer

Ministry of Agriculture (MACA)

NATIONAL LEVEL
Freddy Teodovich Ortiz, Sub-Secretary
Jaime Sejas, Director General of the Agriculture Division
Hector Nogales, Head of Statistics Department
José B. Bascope, National Director of Plant Sanitation
José Camacho T., Head of the Department of Plant Quarantine
Antonio Calderón, Head of the Department of Pesticides
Oscar Benavides, Director of the Conservation and Reforestation Program
in the Department of La Paz, National Forestry Corporation

Ministry of Agriculture (Continued)

REGIONAL LEVEL

Rolando Morro, Coordinator, La Paz Forestry Center

Raúl Hinojosa, Entomologist, Plant Sanitation Program, Cochabamba

José Lopez, Pesticides Inspector, Cochabamba

Ministry of Industry, Commerce, and Tourism (MICT)

NATIONAL LEVEL

Raúl Soria Ruiz, Director General of Domestic Commerce

Willy Daza, National Director of the Wheat Program

REGIONAL LEVEL

Jaime Guzman, Wheat Program Administrator, Chuquisaca

Ivan Chopitea, Marketing Director, Yamparaez Wheat Collection Center

Elsa Romero de Cortez, Marketing Director, Redención Pampa Wheat Collection Center

Oscar Hidalgo, Marketing Director, Cliza Wheat Collection Center

Roberto Salgueiro, Wheat Program Regional Director, Cochabamba

José Maldonado, Silo Inspector, Sucre

David Romero, MICT Representative for Tarija

Marta Vaca Guzman de Casa, Wheat Program Regional Director, Tarija

Angel Narvaez, Regional Program Administrator, Tarija

Pan American Health Organization (PAHO)

Vladimiro Rathauer, Country Representative

Ministry of Public Health (MSPPS)

NATIONAL LEVEL

Oscar Serate, Sub-Secretary of Public Health

Humberto Saavedra, Head of National Malaria Eradication Program (SNEM)

Roberto Vargas, Head of National Immunization Program

Mario LaGrava, Head of Epidemiology Division

Fernando Pinell, Head of Tuberculosis Division

Angel Valencia, Head of Chagas Program

REGIONAL LEVEL

Victor Lora, Epidemiologist, SNEM, Cochabamba

Saúl Villaroel, Malaria Zone Chief, Cochabamba

William McManus, PAHO Advisor to Malaria Program, Cochabamba

Freddy Peñafiel, Director of Health Unit, Cochabamba

Rosario Zambrana, Epidemiologist, Cochabamba Health Unit

René Lezcano, Head of Tuberculosis Division, Cochabamba Health Unit

Roberto Agudo, Director, San Francisco Hospital, Chapare

Ministry of Public Health (Continued)

Walter Julio Fortine, Director, Santa Cruz Health Unit
Jore Luis Cespedes, SNEM Chief, Santa Cruz
Farror Balderrama, Epidemiologist, Santa Cruz Health Unit

National Institute for Food and Nutrition (INAN)

Jaime Barrón Montes, Administrator
Ruth Vera, Chief of Research
Conrado Suaznabar, Chief of Training
Polonio Mañueco M., Economist

National Community Development Service (SNDC)

NATIONAL LEVEL

Armando Callejas, National Director
Jaime Mendoza, Departmental Program Director, La Paz

REGIONAL LEVEL

Mario Guzmán, Regional Director, Cochabamba
Roberto Ruiz, Director of the National Irrigation Program, Cochabamba
René Barea, Administrator, Department of Irrigation, Cochabamba
Emijidio Castellón, Resident Engineer, Cochabamba
Josefina Chavez, Regional Supervisor of Promotors, Cochabamba
Hugo Bustillos, Departmental Program Director, Sucre
Julio Zegarra, Head of Irrigation Division, Sucre
Hugo Pierola, Irrigation Agronomist, Sucre

ERTS (Satellite Mapping) Program

Antonio Perez, National Director

Vinto Adventist College (Campesino Scholarship Program), Cochabamba

Guido Medina, Director
Leonard Westermeir, Business Manager

Bolivian Agricultural Bank (BAB)

NATIONAL LEVEL

Mario Cándida, National Director

Walter Durán, Sub-Director

Alfredo Salazar, Credit Manager

Juan Mercado, Chief of Planning

REGIONAL LEVEL

Victor G. Rivera, Regional Credit Agent, Tarija

Jaime Miranda, Regional Credit Agent, Buena Vista

Martín Dávila Gutierrez, BAB Director, Chuquisaca

Jaime Barrero, Regional PCPA Credit Agent, Chuquisaca

Jorge Zapata, Mobile PCPA Credit Agent, Chuquisaca

Augusto García, Mobile PCPA Credit Agent, Santa Cruz

Roger Serrano, Regional Accountant, Santa Cruz

AGRICULTURAL INSURANCE PROGRAM (ASBA), COCHABAMBA

Gerardo Mendoza, Asesor

René Marquez, Field Agent

Severo Ticona, Field Agent

National Office of Integral Cooperatives (OCICOOP)

NATIONAL LEVEL

Tyrone Heinrich, Executive Director

Freddy Canedo C., Financial Manager, FENACRE

Remberto Torres, Administrator

Alberto Montero, Technician

REGIONAL LEVEL

Emilio Cano, Manager of the Integral Cooperative of Punata

Mario Licuona, Manager of the Integral Cooperative of Montero

Zenón Siles, Accountant, Montero Cooperative

Regional Development Corporation of La Paz (CORDEPAZ)

Pastor Yanguas, Director of Planning and Projects

Percy Baptista, Agronomist

Serafin Rabaj, Planner, Region I

Juán José Guzmán, Head of Region I-A, Director of Artif. Insem. Project

José Luis Morató, Director of the Agricultural Division

Iver Salazar B., Head of the Livestock Health Project

Luz Ana Marquez, Laboratory Technician, Kalletaca Farm

Regional Development Corporation of Santa Cruz (CORDECRUZ)

Nancy Fleig, Head of the Department of Agricultural Finance
Ronaldo Castedo, Head of the Small Ponds Project
Jesús Bolívar, Manager, Mairana Nutritional Products

Regional Development Corporation of Cochabamba (CORDECO)

Lailo Cordero Vide, Director of Planning
Hermogenes Espinoza, Specialist in Irrigation and Drainage
Constantino Soto, Soils Specialist
Armando Torrico, Head of Division of Project and Program Implementation
Raúl Meneses, Head of Tarwi Project
Asención Gonzales, Head of the Forestry Division
Orlando Guzman, Head of the Rabbit Project
Germán Ugarte, Head of Division of Projects

Regional Development Corporation of Chuquisaca (CORDECH)

Eloy Martínez, Head of the Implementation Unit
Marcel Civera, Head of the Planning Unit
German Paz, Head of the Administration Unit
Ronald Camacho, Head of the Department of Planning
Gonzalo Villa, Head of the Department of Projects
Saul Leon, Head of the Department of Social Development
Raul Quintana, Head of the Department of Industry
Alberto Pinto, Head of the Department of Infrastructure
René Garratt, Advisor to the Implementation Unit
Enrique Murguia, Economist, Department of Projects
Marcelo Sandoval, Economist, Department of Projects
Gustavo Sandi, Engineer, Department of Planning
Edil Siles, Head of the Poultry Project
Daniel Cors, Head of the Fish Project
Jorge Teguár, Head of the Sheep Project

Regional Development Corporation of Tarija (CODETAR)

Enrique Borda Lea-Plaza, Production Supervisor of Poultry Project
Wolfgang Niegel, Fruit Tree Specialist (Advisor from W.Germany)
José Arcíenega, Head of the Department of Planning
Arturo Liebers, Director of Hydrographic Activities
Juvencio Sanchez, Monitor for the Erquis Project
Fernando Paz, Advisor from the Directorate of Enterprises

CODETAR (Continued)

Oscar Farfán, Director of Enterprises

Jaime Mendoza, Head of the Agricultural Department

Ivan Galarza, Director of Rural Development

Gabriel Gaite U., Director of Planning and Projects

Raymundo Montaño H., Monitor for the Fruit Orchard Project

Daniel España, Manager of the Tarija Poultry Project

A N N E X B

LIST OF PERSONS CONTACTED:
RURAL COMMUNITY AND BENEFICIARY INTERVIEWS

Agricultural Credit (PCPA)

LA PAZ

Daniel Vasquez, Credit Agent for
Murillo Province

Remigio Pacari Asistiri, Tahuapalca
(Murillo)

Celestino Pacari, Tahuapalca

Hilarion Alvarez Condori, Tahuapalca

Adolfo Mamani Myta, Tahuapalca

Daniel Mamani, Tahuapalca

Lucio Reyes Ortiz, Tahuapalca

Máximo Sacari, Santa Rosa (Nor Yungas)

Cleto Hato Gilaya, Santa Rosa

Angel Hernandez, San José (Coroico)

Inocencio Callisaya Tinaya, Las Uni-
das (Coroico)

Bertha Bracamante Viuda de Mattas,
Polo Polo (Coroico)

Luz Asturizaga Viuda de Mamani, Polo
Polo

Francisco Asturizaga Calle, Polo Polo

Felix Sosa Sacaticona, Santa Rosa
(Pacallo)

Benigna Gil Mendez, Charubamba
(Pacallo)

Lino Escobar Nogueño, Charubamba

Francisco Flores Flores, Viscachani
(Aroma)

Fabian Mallo Care, Viscachani

Pedro Febrero Ali, Viscachani

Jorge Febrero Ali, Viscachani

Macario Carrion, Carayapa (Loayza)

Anatolio Deheza Gómez, Carayapa

Meliton Sauzide, Carayapa

SANTA CRUZ

Rolando Rivera Cruz, Quebrada del
Horno (Andrés Ibañez)

Victor Bejarano Diaz, Limoncito
(Ibañez)

Sabino Romero, Limoncito

Juan Contreras Paniaga, Limoncito

SANTA CRUZ (Continued)

Felix Villamontes, Coop. Gualberto
Villareal, Km.19, Faja Central

Jaime Olivera Olivera, C.G.V., Km.11

Agustín García Maldonado, C.G.V.,
Km.2

Felix Rocha Chelino, Coop. Media
Luna, Faja Central

Florencio Perez Lazo, C.M.L., Km.24

Emilio Sureta Sejas, C.M.L., Km.24

Anaceto Perez Lazo, C.M.L.

Segundo Contreras Molina, Limoncito

Justo Padilla Salazar, Limoncito

Pilar Zarate de Zambrano, Buenavista
(Ibañez)

Sebastian Yanés Cayo, Valle Hermo-
so (Ichilo)

Rafael Escobar, Credit Agent for
Ibañez Province

COCHABAMBA

René Marquez, Credit Agent for
Quillacollo Province

Pacifico Rocasado, Parotani (Quilla-
collo)

Daniel Rocasado, Parotani

Nicanor Peñalosa, Viloncilla
(Quillacollo)

Benigno Diaz Acosta, Santa Rita
(Chapare)

COCHABAMBA: ASBA BENEFICIARIES

Sinferiano Terrazas, Parotani

Nicanor Chavez, Parotani

Fabio Severichi, Vilamilla (Quilla-
collo)

Pablo Ciancas, Rodeo (Chapare)

Gregorio Rojas, Melga (Chapare)

Sexto Trujillo, Melga

Agricultural Credit (Continued)

CHUQUISACA

Demetrio Quispe, Tejahuasi (Oropeza)
Modesto Flores, Tejahuasi
Daniel Zarate, Choco (Oropeza)
Manuel Cochi, Choco
Sesor Vela, Media Luna (Oropeza)
Dionicio Vela, Media Luna
TARIJA
Raul Rueda, Portillo (Cercado)
Fermo Rodriguez, San Isidro (Aviles)
Bernardo Rodriguez Romero, San Isidro
Vidal Ruiz, Higuera (Aviles)

TARIJA (Continued)

Bernardo Velasquez, Calamuchita
(Aviles)
Lindolfo Ordonez, Calamuchita
Vidal Garcia, Santa Ana La Vieja
(Cercado)
Fernando Rojas, La Pintada (Cer-
cado)
Arnildo Guerrero, Concepcion
(Aviles)
Manuel Alcoba, Concepcion
Felipe Zenteno, El Mollar (Mendez)

Mairana Corn Production Project
in Santa Cruz (Florida)

Isidro Molina Mancilla, Villa Vic-
toria
Gabino Peña García, Las Piedras
(Florida)
Hipolito Delgadillo Padilla, Las
Piedras
Alfredo Toledo Candia, San Isidro

Omonte Rivero Ofeda, Mendiola
Ramona Yepez de Contreras, Li-
moncito
Bernardino Padilla Aguilera,
Monteagudo
Maximiliano Cabrera Peña, Monte-
agudo
Gregorio Saldia Rojas, Monteagudo

Wheat Collection Centers

CHUQUISACA (Yamparaez)
Elena de Rivera, Pampa Yamparaez
Pedro Barrientos, Pampa Yamparaez
Genaro Choque, Pampa Yamparaez
TOTORA (Carrasco)
Emilio Jinojosa, Totora
Miguel Inosente, Huyra Kasa
Elicio Hinojosa, Totora
Carlos Viscarra, Silo Supervisor
CLIZA (Esteban Arce)
Patrocinio Claros, Quecoma
Francisco Fernandez, Sacabamba
Luis Montaño, Sacabamba
Felix Diaz, Matarani

CLIZA (Continued)

Emilio Quispe, Matarani
TARIJA
Mauricio Rivas, Yesera Norte
(Cercado)
Jacinto Segolia, Junacas (Mendez)
Rafael Tejerina, Junacas
Bernarda Sosa, Junacas
Eloy Levis Fernandez, Junacas
Suelo Aguirre, San Lorencito
(Mendez)
Ramon Estrada, Polla

Forestation Projects

HUANCANE, DEPT. LA PAZ
Cipriano Lopez, Chirapaca (Los Andes)
Juan Chura, Chirapaca
Modesto Mamani, Chirapaca
Celestino Chano, Santiago Pacharia (Omasuyo)
Teodoro Quispe, Santiago Pacharia
Tomás Mendoza, Kasina (Omasuyo)
Hipolito Condori, Kasina
Genaro Condori, Pongon Huyo (Omasuyo)
Sabino Condori, Pongon Huyo
MILLU MAYU, COCHABAMBA
Luciano Villarroel, Koari (Arani)
Carlos Alvarado, Koari
Severino Cuchalla, Quecoma (Arce)
Celestino Montaño, Sacabamba (Arce)
Benigno Flores, Matarani (Arce)
Victoriano Baldelomar Camacho, Pauramani (Arani)
Adrian Camacho Merida, Saucayani Alto (Arani)
Benedicto García, Saucayani Alto

COIMATA, DEPT. TARIJA (Mendez)
Telesforo Llanos, Oroseza
Fernando Perales, Canasmoro
Francisco Perales, Canasmoro
Serafin Serrano, Canasmoro
Ricardo Castrillo, Coimata
José Miranda, Coimata
Marcelino Miranda, Coimata
Pedro Ayarde, Coimata
PERTT, DEPT. TARIJA (Mendez)
Salomon Jerez, Coimata
Alejandro Cruz Ortega, Coimata
ERQUIS, DEPT. TARIJA (Mendez)
Luis Castrillo, Erquis
Vidal Ponce, Erquis Sud
Hipolito Rueda, Erquis Sud
Edelberto Sanchez, Erquis Sud
Abel Llanos, Erquis
Esquiel Estrada, Erquis Sud

Micro-Irrigation Projects

CHUQUISACA: TEJAHUASI
Francisco Romero Ramirez
Nicolas Maturana
Vinicio Quispe
COCHABAMBA: TUTY MAYU
Anselmo Sandoval
Celida Almoya
Victor Almoya
Reimundo Sianca
Ponciano Lopez
Fortunato Cabrera Sanchez
Clemente Sanchez
Rosa Sanchez

TARIJA: ERQUIS
Victor Valdez, Erquis
Abel Llanos, Erquis
Isidro Llanos, Oroseza
LA PAZ: ACHACA (Ingavi)
Antonio Choque
Mario Mamani
Hilarion Condori
Velentín Condori
Marcelino Huanca
Luis Choque
Pedro Choque
Isidro Choque
Gregorio Patzi
Bonifacio Patty Choque
Nestor A. Quispe Condori

Campesino Scholarship Project
(Adventist School, Vinto, Cochabamba)

Marcelino Quispe Guzmán, La Paz
Juan Villca, Oruro
Nicolas Huayta, La Paz
Carmelo Flores, La Paz
Hernán Marka, La Paz

Nicolasa Mamay, La Paz
Marta Morales
Lidia Cruz
Elizabet Marka

Fishpond Project, CORDECH

Manuel Cochi, Chaco (Oropeza)
Daniel Zarate, Chaco
Natalio Bellido, La Palma (Oropeza)
Lucio Huanca, La Palma

Tarwi Project, CORDECO

Aquilina Castro, Hura Melga (Chapare)
Simon Sanchez, Condor Puñuna
(Chapare)
Marcos Castro, Condor Puñuna

Tarija Poultry Project

Maria Iriui Valdivioso, Lorensito
(Mendez)
Bernardino Lamaza, Guerra Huaico
(Mendez)
Fernando Rojas, La Pintada
(Cercado)
Clara Gallardo de Rodriguez, San
Isidro (Cercado)
Teofilo Sosa Colque, Tomatitas
Germán Cejerina, Eurumaya (Cercado)

Artificial Insemination Project
(La Paz Department)

Pedro Sanchez, Assistant Inseminator, Kalletaca Farm
Alberto Nina Covi, Quentabí (Andes)
Faustino Huanca Velasco, Janco
Cala (Los Andes)
Alberto Callizaya Calle, Callantaya (Los Andes)
Francisco Pacohuanca Mamani,
Sullcataca (Andes)
Eustaquio Pucara Pacohuanca,
Pomamaya (Murillo)

Interviews with Health Institutions

LA PAZ
Puesto Medico Patacamaya (Aroma)
Puesto Medico Sica Sica (Aroma)
Centro de Salud y Hospital Copacabana
(Manco Capac)
Puesto Sanitario Manco Kapac, Huacuyo
(Manco Capac)
Hospital Aymara de Escoma (Camacho)
Centro de Salud/Hospital 20 de Octubre, Ciudad Satelite, La Paz

SANTA CRUZ

Puesto Sanitario San José (Ibañez)
Puesto Medico El Torno (Ibañez)
Puesto Medico La Guardia (Ibañez)
CHUQUISACA
Centro/Hospital Chuquichuqui
Centro/Hospital Nicolas Ortiz
Puesto de Salud La Palma (Oropeza)
Centro/Hospital Yamparaez

Interviews with Health Institutions

(Continued)

COCHABAMBA

Centro de Salud de Cliza

Unidad Sanitaria de Cochabamba

Interviews with Rural Households Regarding Health and Health Services

LA PAZ

Luciano Condori Torrez, Jaruma (Aroma)
Petrona Marca de Condori, Jaruma
Teofilo Mamani, Tiahuanaco (Ingavi)
Florencio Chipana Piojos, Chacoma
(Aroma)
Felix Aliaga, Jaruma
Raul Apaza, Chairumani (Aroma)
Maria Huaravara de Condori, Huacuyo
(Manco Capac)
Josefa Mamani de Velasco, Huacuyo
Lino Condori Tito, Calamarca (Manco
Capac)
Remedios Choque, Calamarca
Valentin Quispe Tito, Calamarca
Felipe Rojas, Killay Belen (Manco
Capac)
Marta de Condori, Alto de La Paz
Eliza Churata de Yana, Escoma
(Camacho)
Máxima Villanueva, Escoma
SANTA CRUZ
Emiliano Roncales, Rancho Chico
(Ibañez)
Teresa Romero de Menacho, Rancho Ch.
Francisco Terán Paniagua, Portrerito
(Ibañez)
Mariana Salazar, Portrerito
Anastacia Guzmán, San Juan (Ibañez)
Hernán Camacho Rodriguez, San Juan
Gregorio Gutierrez Pardo, San Carlos
(Ibañez)
Arcebiady Iriarte Montaño, San Carlos
Juan Abrego, Los Limos (Ibañez)
Rosalio Coeto Herrera, Los Limos
Simon Avila Valles, Los Limos

SANTA CRUZ (Continued)

María Sarabia, Puerto Rico (Ibañez)
Deterlino Alvy, Puerto Rico
Valentina Obando Viuda de Sambrana,
Puerto Rico
CHUQUISACA
Dionisio Torrez, Tejahuasi (Oropeza)
Celedonio Murillo, La Palma
(Oropeza)
Panfilio Tejerino, El Chaco
(Oropeza)
Margarita Perez, El Chaco
Dimesia Fernandez, Media Luna
(Oropeza)
Pedro Alegre, Pampa Yamparaez
(Yamparaez)
Isabel Puma, Pampa Yamparaez
Fermina Hidalgo, Masay Hajta
Trinidad Quispe, Cabezas (Oropeza)
COCHABAMBA
Guillermo Merubia, Muyu Huyu
(Punata)
Ponciano Galarza, Muyu Huyu
Miguel Franco, Ucureña
Peregrina Rocha, Paracaya (Punata)
Emiliana Reque de Serna, Paracaya
Alfonso Mendieta, Tolata
Margarita Espinosa, Melga (Chapare)

A N N E X C

SCHEDULE OF EVALUATION ACTIVITIES

December 15-20, 1981: Field trip conducted by Aquiles Lanao Flores, a Peruvian economist and accountant who has worked with RDS campesino training projects since 1976, conducted a field trip to the Altiplano, Temperate Valleys, and Tropical Lowlands regions of Bolivia to contact farmer-paratechnicians, explain the purpose of the PL480 evaluation, and ascertain their availability to participate.

With USAID staff and the PL480 Executive Secretariat, Dr. Lanao also completed a tentative selection of the projects to be evaluated by campesino staff.

January 9-10, 1982: Arrival in La Paz of external evaluators Hatch, Hanrahan, Connolly, and Hirschhorn

January 11: External evaluators meet with U.S. Ambassador, USAID staff, and the Executive Secretariat; campesino evaluators begin to arrive in La Paz.

January 12: First day of training of campesino evaluators, who are amply briefed by Secretariat staff on PL480-funded projects; external evaluators begin document review of Program. User interviews begin.

January 13: Training of campesino evaluators concludes; meeting with officials of the Agricultural Bank; document review continues.

January 14: Interviews with the Wheat Marketing Division of MICT, ERTs project, CORDEPAZ; logistical arrangements for field trips concluded, and schedule co-ordinated with Secretariat.

January 15: Field visits to Livestock Insemination and Animal Health projects at Calletaca; Huancané forestation project; interview with Plant Health Department of MACA.

January 16: Field visit to Achaca Irrigation Project with SNDC staff.

Annex C, page 2

January 17: Hatch departs for Peru; Hirschhorn travels to Copacabana; Hanrahan and Morales to Santa Cruz.

January 18: Field visits to rural health institutions in Altiplano by Hirschhorn; Hanrahan visits BAB/PCPA in Santa Cruz and meets with CORDECRAZ; Secretariat staff meets Ortuño in Sucre to initiate project visits in Chuquisaca with campesino staff; Connolly initiates USAID and ministry contacts to study GOB compliance with PL480 policy commitments.

January 19: Hirschhorn meets with USAID Health Office and INAN; Field visits by Hanrahan to BAB/PCPA in Buena Vista, BAB users in Yapacaní, ONCICOOP in Montero.

January 20: Hanrahan visits Mairana Maize Production Project, CORDECRAZ

January 21: Hirschhorn travels from La Paz, and Hanrahan from Santa Cruz, to Sucre; Morales to Cochabamba; interviews in Sucre with CORDECH. Faich departs New York for La Paz following discussions with Hatch.

January 22: Faich arrives in La Paz; Hirschhorn and Hanrahan interview BAB/PCPA, SNDC; field visits made to Tejahuasi irrigation, CORDECH fish ponds.

January 23: Hirschhorn and Hanrahan visit Yamparaez wheat collection center

January 24: External evaluators, Secretariat, and campesino staff travel to Cochabamba by road; visit to the Totora wheat collection center.

January 25: Faich meets with U.S. Mission, Secretariat, and MPSSP representatives in La Paz, begins document review; Hirschhorn and Hanrahan meet with SNDC national office of micro-irrigation project in Cochabamba, also with MICT/WMD, CORDECO, and BAB-PCPA representatives.

January 26: In Cochabamba, interviews with CORDECO, ONCICOOP, Plant Health Division of MACA; field visits to CORDECO rabbit production, Colegio Vincio (Scholarships Project.

January 27: Field visits to Tarwi production by INAN/CORDECO, Tuti Mayu irrigation system, Melga potato production by ASBA/

PCPA, Millu Mayu forestation at Tiraque by CORDECO.

January 28: First campesino staff debriefing; Hanrahan and Hirschhorn travel to Tarija; interview with BAB/PCPA. Hatch leaves New York for Bolivia via Panamá.

January 29: In Tarija, interviews with CODETAR and PERTT.

January 30: In Tarija, field visits to CODETAR poultry project, Rio Erquis irrigation, Coimata fruit nursery; Hatch arrives in La Paz; Hirschhorn travels to La Paz, debriefs with Hatch on her findings, departs for Peru.

January 31: In Tarija, field visits to PERTT forestation; Faich departs La Paz for Cochabamba; Hatch meets with Connolly and USAID Director.

February 1: In Tarija, interview with MICT/WMD, field visit to wheat collection center; Faich interviews health institutions in Cochabamba region; Hatch travels to Tarija, conducts second campesino staff debriefing on impact findings.

February 2: Second campesino staff debriefing concluded; evaluators depart for Cochabamba; third campesino staff debriefing is conducted.

February 3: Faich travels to Santa Cruz; Hatch, Hanrahan, Morales, and Ortuño to La Paz; fourth campesino staff debriefing completed.

February 4: Interviews at the Secretariat by Hanrahan covering colonization roads, campesino scholarships, and rural development studies; Hatch, Morales, and Ortuño tabulate impact evaluation data; Faich arrives from Sta.Cruz.

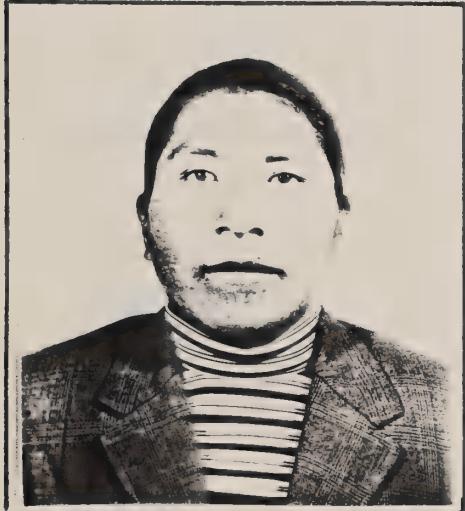
February 5: Presentation of preliminary findings of evaluation by Faich, Hatch, and Hanrahan to U.S.Mission staff and Secretariat; impact data tabulation continues.

February 6: Impact evaluation data tabulation concluded; evaluators depart Bolivia.

A N N E X D.

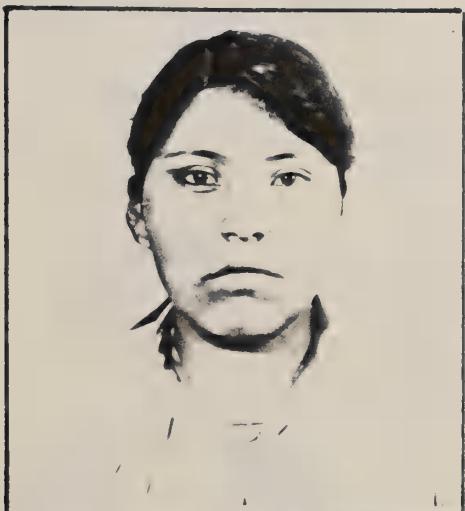
CAMPESINO STAFF WHO CONDUCTED
THE IMPACT EVALUATION

1. HIGHLANDS REGION



ROSALIA QUELCA AYALA, Age 42, is an Aymara-speaker, native of the highland province of Manco Kapac which borders Peru and Lake Titicaca. Rosalia first worked as promotora of projects with rural women for the National Community Development Service. Since July 1981 she has been employed by Rural Development Services as a field investigator collecting information on rural health, nutrition, and household management activities of campesino families.

For this evaluation, Rosalia interviewed the staffs of five rural health institutions, and visited ten campesino households to collect opinions about health and health services.



TEODOCIA VILLANUEVA SOLARES, Age 26, is an Aymara-speaker from the highland province of Aroma. After serving as a field worker for the National Community Development Service, Teodocia joined the staff of RDS in July 1981 where she documents household subsistence activities and teaches record-keeping skills to rural women in two Altiplano communities.

For this evaluation, Teodocia interviewed users of the CORDEPAZ Animal Health and Insemination projects, visited two rural health institutions, and made 5 household visits to collect health data and campesino opinions of health services.



SANTIAGO TORREZ, Age 30, lives in the community of Jaruma, Aroma Province, Dept. La Paz. He has 8 years of schooling, is married, and has one child. Santiago farms about 4 hectares planted to potatoes, barley, onions, and oca. In addition, he raises 48 sheep and five head of cattle. Santiago was the first resident in his community to learn to use a typewriter, for which distinction his neighbors call him "the lawyer". For the impact evaluation of the PL480 program, Santiago interviewed 12 campesino users of PCPA production credit.



ANDRES COAQUIRA QUISPE, Age 40, is an Aymara from the community of Huacuyo, Manco Kapac Province, Dept. La Paz. He has 5 years of school and is married with two children. He cultivates 1.9 hectares of land planted to potatoes, barley, broad beans, and tarwi. His family also raises 3 head of cattle and 25 sheep. Andres is skilled as a carpenter, musician, and repairs radios and clocks for his neighbors. From 1979 to the present he has kept meticulous farm records, and during the impact evaluation--when he interviewed 11 campesino users of PCPA production credit-- he taught his system of record-keeping to five of them.

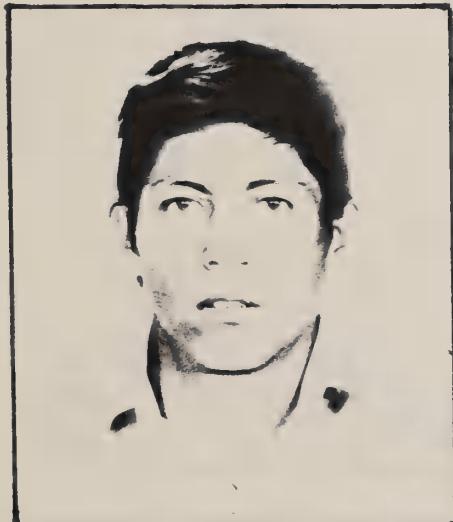


DANIEL MORANTE, Age 27, comes from the Aymara community of Chairumani, Aroma Province, Dept. La Paz. He is married with one son. He cultivates 2.7 hectares planted to potatoes, barley, broadbeans, onions, and oca. His livestock holdings include 2 teams of oxen and 30 sheep. For the impact evaluation he interviewed nine beneficiaries of the forestry projects served by the Huancané Nursery. These users were scattered in five communities in four projects, for which assignment Daniel had to do quite a bit of walking.

2. TEMPORATE VELLEYS REGION



RAUL ROJAS, age 23, is a Quechua-speaker from the community of Melga, Chapare Province, Cochabamba. Raul has 9 years of schooling, is unmarried, and recently took over the family farm following the death of his father. He farms 3 hectares planted to potatoes, corn, wheat, broadbeans, onions, and oca. His mother and two sisters raise 37 sheep plus a team of oxen. Raul interviewed 6 campesino users of PCPA production credit, 3 users of forestation, and 3 users of wheat collection centers.



TIMOTEO FLORES PEÑARANDA, age 27, is married with two sons. He comes from the lowlands colonization of Naranjal, Ichilo Province, Dept. Santa Cruz. He has 5 years of schooling and is a native speaker of Quechua. Timoteo farms 5 hectares planted to rice, corn, vegetables, and citrus crops. He raises 21 head of cattle and swine. He also earns seasonal income as a tractor driver. For the PL480 evaluation, Timoteo was borrowed away from his native lowland tropics to cover the Chuquisaca region. There he interviewed 6 PCPA credit users, 3 irrigation users, 4 fishpond users, and 5 users of wheat collection centers.

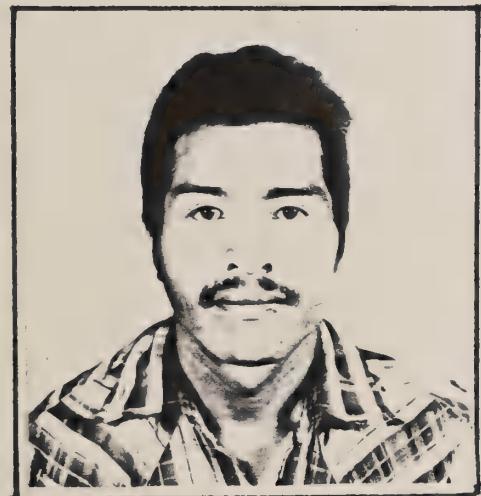


SIMON MERIDA, age 46, is married with 6 children and comes from Aiquile, Campero Province, Dept. Cochabamba. For many years he has worked for the National Community Development Service as a rural promotor. A Quechua speaker, Simón was lent to the evaluation by the SNDC to assist with project beneficiary interviews in the Tarija region. There he contacted 6 PCPA credit users, 3 forestation users, 4 users of the Coimata fruit project, 3 users of wheat collection centers, and 2 members of the Tarija poultry project.

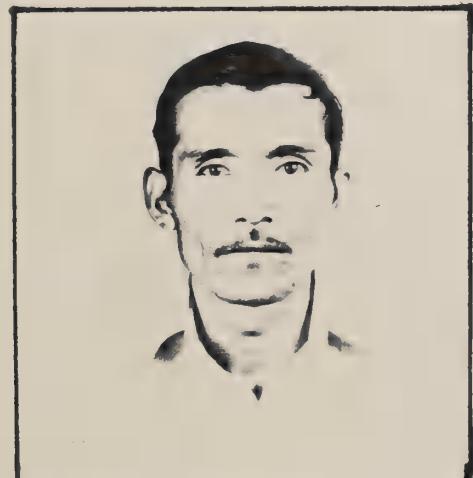


3. TROPICAL LOWLANDS REGION

AQUILINA TUCO VERA, age 28, is an Aymara-speaker born in the highlands but raised in Santa Cruz. Until July 1980 she had worked as a promotora of projects for rural women for the National Community Development Service. But for the last two years Aquilina has worked for Rural Development Services as a field investigator collecting health, nutrition, and household management information in five lowlands communities, while teaching record-keeping skills to rural women. For this evaluation she contacted 4 users of PCPA credit, visited 4 rural health institutions, and interviewed 14 households about their health and use of health services.



SABINO ARAYAZA, age 31, is married with 3 children. He is a resident of the community of Valle Hermoso, Ichilo Province, where he serves as President of the School Committee. He cultivates 6 hectares planted to rice, corn, vegetables, watermelon, citrus crops, and improved pasture. He raises 14 head of cattle and 2 swine. For this evaluation he interviewed 5 users of PCPA credit and 2 participants in the Mairana corn production project.



AURELIO GARCIA, age 32, married with 4 sons, also comes from the community of Valle Hermoso, one of the oldest GOB colonization projects. He has 5 years of schooling and is a native speaker of Quechua. He grows rice, corn, plantains, vegetables, and pasture crops. He raises 3 head of cattle and 4 swine. Aurelio is the Secretary of his community's Development Committee. For this evaluation he interviewed seven PCPA credit users, including 4 members of the Mairana project.

TABLE 1. Case Reports EPI Diseases 1977 - 1981, Bolivia**

YEAR	<u>Poliomyelitis</u>			<u>Diphtheria</u>			<u>Pertussis</u>			<u>Tetanus</u>			<u>Measles</u>		
	Nat	Cocha	St Cruz	Nat	Cocha	St Cruz	Nat	Cocha	St Cruz	Nat	Cocha	St Cruz	Nat	Cocha	St Cruz
1977	134	35	-	138	29	-	4086	280	-	163	17	-	7798	615	-
1978	20	9	-	48	15	-	2169	25	-	94	1	-	2570	39	-
1979	433	131	-	26	13	-	1746	176	-	125	9	-	4365	582	-
1980	40	2	25	56	36	3	2078	378	696	148	9	131	3258	164	529
1981*	9	2	3	16	5	2	3293	1006	726	151	16	130	4594	1070	886

*National based on data through August adding 50% to cover remaining four months
 Coch - until October adding 16% to cover remaining two months
 St. Cruz - actual year totals

A N N E X E.

TABLE 2.

Diseases by Age**
Cochabamba

Disease	Year	Total No. of Cases	<1 year	1 - 4 years	5+	Unknown
Polio	1979	131	25	106	0	1
Diphtheria	1980	36	3	4	29	-
Pertussis	1981*	876	266	413	197	-
Tetanus	1981*	14	7	3	4	-
Measles	1981*	925	164	517	243	183

*Based on January - October 1981

**Years selected to provide enough cases for examining age distributions.

TABLE 3

Diseases by Urban vs Rural Residence
Cochabamba, Bolivia

Disease	Year**	Total	Number (%)	
			Urban	Rural
Polio	1979	131	71 (54%)	60 (46%)
Diphtheria	1980	36	24 (66%)	12 (33%)
Pertussis	1981*	876	347 (45%)	529 (55%)
Tetanus	1981*	14	9 (64%)	5 (36%)
Measles	1981*	925	336 (36%)	589 (64%)

*January through October

**Years selected to provide enough cases

TABLE 4.

Immunization Levels*
 Total Bolivia, 1981 (Complete)
 Number (%)

Estimated Pop**	AGE								Total	
	<1 year		1 year		2 years		3 or more years			
	No.	%	No.	%	No.	%	No.	No.		
Polio - 1st	81,370	(41)	36,099	(19)	34,481	(18)	46,148	198,098		
2nd	45,405	(23)	24,797	(13)	24,537	(13)	31,832	126,571		
3rd	27,684	(14)	21,651	(11)	20,746	(11)	34,411	104,492		
DTP	1st	77,637	(39)	35,554	(19)	33,737	(18)	46,120	193,048	
	2nd	42,950	(23)	23,480	(12)	22,748	(12)	30,732	119,910	
	3rd	26,188	(13)	18,776	(10)	16,929	(9)	28,500	90,393	
Measles		34,488	(17)	38,479	(20)	34,816	(18)	77,151	184,934	

*MSPPS - EPI Program

**Projected from Bolivia en Cifras 1980, Instituto Nacional de Estadistica p. 31

TABLE 5

Immunization Levels
 Total Bolivia, 1980*
 Number (%)

Estimated Pop**	AGE								Total	
	<1 year		1 year		2 years		3 or more years			
	No.	%	No.	%	No.	%	No.	No.		
Polio - 1st	75,174	(38)	39,098	(20)	36,253	(19)	60,195	210,720		
2nd	42,150	(21)	23,133	(12)	20,928	(11)	31,867	118,087		
3rd	25,260	(13)	19,853	(10)	19,950	(11)	41,868	106,931		
DTP	1st	67,173	(35)	30,847	(16)	30,174	(16)	41,736	169,970	
	2nd	34,683	(17)	17,029	(9)	15,845	(8)	21,840	89,397	
	3rd	19,690	(10)	11,900	(6)	10,547	(6)	16,826	58,963	
Measles		23,869	(12)	30,000	(16)	25,839	(14)	48,253	127,961	

*Numerators from report of Dr. T. Steven Jones, percent calculated by GAF based on estimated population given.

**Bolivia en Cifras 1980

TABLE 4
 Immunization Levels
 Santa Cruz Department Total, 1981 (complete)*

	<u>A G E</u>				3 or more years	Total			
	<1 year		1 year						
Estimated Pop**	27,604	25,879		25,879	?	?			
	No.	%	No.	%	No.	%	No.	No.	
Polio - 1st	19,601	(71)	5,405	(21)	4,413	(17)	6,502	35,926	
2nd	10,810	(39)	4,099	(16)	3,405	(13)	5,340	23,654	
3rd	6,419	(23)	7,902	(31)	4,500	(17)	7,857	26,678	
DTP	1st	19,346	(70)	5,689	(22)	5,746	(22)	7,045	36,826
2nd	9,915	(36)	3,790	(15)	3,190	(12)	4,523	21,418	
3rd	6,215	(23)	3,956	(15)	3,142	(12)	4,725	18,038	
Measles	7,545	(27)	5,807	(22)	3,678	(14)	6,875	23,905	

*Unidad de Salud Santa Cruz

**Crude estimate based on estimated total pop. of 862,637
 and <1 = 3.2%; 1,2 each = 3% (Bolivia en Cifras 1980).

TABLE 5
 Immunization Levels
 Cochabamba Department Total*, 1981

	<u>A G E</u>				3 or more years	Total			
	<1 year		1 year						
Estimated Pop**	No.	%	No.	%	No.	No.			
Polio - 1st	12,356	(44)	5,279	(20)	5,118	(19)	4,284	27,032	
2nd	6,989	(25)	3,350	(13)	3,450	(13)	1,963	15,752	
3rd	7,257	(26)	6,788	(26)	7,169	(27)	4,587	25,801	
DTP	1st	7,846	(28)	4,841	(18)	4,021	(15)	1,799	18,507
2nd	6,006	(21)	2,472	(9)	2,503	(10)	1,829	12,810	
3rd	5,120	(18)	2,859	(11)	2,859	(11)	3,702	14,517	
Measles	4,675	(17)	6,545	(25)	5,748	(22)	9,440	26,408	

*Unidad Sanitaria based on data through October 1981 adding 5% for November and December 1981

**Based on a total population of 875,000 (Bolivia en Cifras 1980) applying 3.2%, 3% and 3% for <1, 1 and 2 year olds.

TABLE 6

Immunization Levels
Cochabamba Capital
1981 Complete*

AGE

Estimated Pop**	<1 year		1 year		2 years		3 or more years		Total
	No.	%	No.	%	No.	%	No.		
Polio - 1st	8,576	(13)	2,825	(40)	2,428	(34)	1,212		15,041
2nd	5,640	(75)	2,184	(31)	2,075	(29)	1,004		10,903
3rd	6,000	(76)	5,843	(82)	5,944	(84)	3,009		20,796
DTP	1st	4,135	(55)	1,894	(27)	1,378	(19)	907	8,314
	2nd	4,697	(62)	1,391	(20)	1,133	(16)	825	8,046
	3rd	4,045	(53)	1,841	(26)	1,607	(23)	2,127	9,620
Measles		3,850	(51)	3,463	(49)	2,456	(35)	2,665	12,434

*Unidad Sanitaria based on data through October 1981, adding 5% for November and December.

**Based on total population of 236,564 (Bolivia en Cifras 1980) used 3.2% for <1, 3% for 1 and 2.

TABLE 7

Immunization Levels
Cochabamba Rural
1981 Complete*

Estimated Pop**	<1 year		1 year		2 years		3 or more years		Total
	No.	%	No.	%	No.	%	No.		
Polio - 1st	3,780	(19)	2,454	(13)	2,690	(14)	3,072		11,996
2nd	1,349	(7)	1,166	(6)	1,375	(7)	959		4,849
3rd	1,257	(6)	945	(5)	1,225	(6)	1,578		5,005
DTP	1st	3,711	(18)	2,947	(15)	2,643	(14)	892	10,193
	2nd	1,309	(6)	1,081	(6)	1,370	(7)	1,004	4,764
	3rd	1,075	(5)	990	(5)	1,252	(7)	1,580	4,892
Measles		825	(4)	3,082	(16)	3,292	(16)	6,775	13,974

*Unidad Sanitaria based on data through October 1981 adding 5% for November and December 1981. Rural here means all population outside department capital.

**Based on population of 638,436 (Bolivia en Cifras 1980) applying 3.2%, 3% and 3% for <1, 1 and 2 year olds.

TABLE 8

Immunization Levels
Santa Cruz Capital City*
1981 Complete

A G E

	<1 year		1 year		2 years		3 or more years		Total
	No.	%	No.	%	No.	%	No.	No.	
Estimated Pop**	10,560		9,919		9,919		?	?	
Polio - 1st	13,494	(128)	2,434	(25)	1,762	(18)	2,582	20,272	
2nd	8,107	(77)	1,931	(19)	1,654	(17)	2,778	14,470	
3rd	5,061	(48)	3,129	(32)	2,789	(28)	5,523	16,502	
DTP	12,827	(121)	2,610	(26)	2,112	(21)	3,001	20,550	
1st	7,382	(70)	1,796	(18)	1,470	(15)	2,276	12,924	
2nd	4,848	(46)	2,319	(23)	1,663	(17)	2,421	11,251	
Measles	4,595	(44)	2,861	(29)	1,464	(15)	2,681	11,601	

*Source: Unidad de Salud

**Based on total population of 330,635 with age projections of <1 = 3.2%; 1 and 2 each = 3%

TABLE 9

Immunization Levels
Santa Cruz Rural*

A G E

	<1 year		1 year		2 years		3 or more years		Total
	No.	%	No.	%	No.	%	No.	No.	
Estimated Pop**	17,024		15,960		15,960		?	?	
Polio - 1st	6,107	(36)	2,971	(19)	2,651	(17)	3,925	15,654	
2nd	2,703	(16)	2,168	(14)	1,751	(11)	2,562	9,184	
3rd	1,358	(8)	4,773	(30)	1,711	(11)	2,334	10,176	
DTP	6,519	(38)	3,079	(19)	3,634	(23)	4,044	16,276	
1st	2,533	(15)	1,994	(12)	1,720	(11)	2,247	8,494	
2nd	1,367	(8)	1,637	(10)	1,479	(9)	2,304	6,787	
Measles	2,950	(17)	2,946	(18)	2,214	(14)	4,194	12,304	

*Unidad de Salud, rural here means all the population outside the department capital

**Based on estimated population of 532,002 with age projections of <1 = 3.2%; 1, 2 each = 3% (Bolivia en Cifras 1980).

NATIONAL AGRICULTURAL LIBRARY

1022456160

NATIONAL AGRICULTURAL LIBRARY



1022456160